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Dance Specific Integrative Methods to Incorporate Supplemental Training into a Technique Class

THESIS

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ABSTRACT OF THESIS

Dance Specific Integrative Methods to
Incorporate Supplemental Training into a Technique Class

By

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This thesis explores how to incorporate muscular strengthening and cardiorespiratory conditioning within a collegiate level modern dance technique class. The methodology for this study included three main components: literature review, interviews, and workshops. Previous research on this specific topic mainly tracked the benefits of conditioning for dancers outside of the technique class, rather than incorporating conditioning within a dance technique class. The main components researched were the proper frequency, intensity, time, and type of strengthening and cardiorespiratory conditioning needed to induce physiological adaptation in dancers. Interviews were conducted with dance professionals who teach collegiate level modern dance and supplemental training practitioners who work with dancers. Based on commonalities found within the literature and interviews, two thirty-minute modern dance workshops were designed. UCI dance majors participated in the workshops and were surveyed for feedback. This body of work increases our knowledge in the area of conditioning for dancers. It helps to develop a framework to aid dance instructors in applying muscular strengthening and cardiorespiratory conditioning into technique classes of their own. The ability of dance instructors to incorporate

conditioning into technique classes may help to improve the fitness of dancers. In turn, this increased level of fitness may enable dancers to perform at greater levels with less injury allowing collegiate level dancers a better chance at professional careers.

CHAPTER ONE

The Demands of Today's Dancers and The Current Gap in Dance Training

The expectations of today's modern dancer go beyond that of traditional modern dance training. Traditional modern dance training followed the lineages of modern dance pioneers like Martha Graham, but today the lines have been crossed. Even the lines between contemporary styles of ballet, jazz, and modern are becoming less visible. This means that modern dancers may be asked to perform in many styles of movement (Watkins and Clarkson 9; Weiss et al. 41). Today's modern dancer needs to be prepared for anything, and to be able to move in any way (Wyon, "Preparing" 68; Berardi 115; Watkins and Clarkson 9) in order to keep up with current physiological demands (Angioi et al. 475-476; Berardi 141, Brown et al. 38; Grove et al. 70; Koutedakis et al. 29) trending in choreography (Angioi et al., "Fitness" 475; Angioi et al., "Association" 121; Berardi 141). The modern dance movement vocabulary has grown to encompass a wide variety of physical actions such as: falling, inverting, partnering, jumping, sliding, and other gymnastics based movements (Sides et al. 44; Vetter 178; Wyon et al., "Time" 854). The intensity of this dance style is amplified by the decreased use of gender roles in modern dance, which implements men and women equally (Wyon et al., "Time" 854; Wyon, "Preparing" 67). Today's modern dance choreography pushes dancers to their physical extreme (Dancers As Athletes; Grove et al. 70; Rafferty 45). Some dance companies, like Diavolo Dance Theatre, require a specified level of strength to perform dance works with a highly physical aesthetic. Sources have described the choreography of today as "complex," "arduous" (Wyon, "Preparing" 67), and "athletic" (Koutedakis et al. 808). One study reported that in comparison to

ballet dancers, modern dancers spent more time actually dancing during performances (Wyon et al., “Time” 853). Athletic ability is now just as important as artistry, which means it is equally important to increase a modern dancer’s fitness level as it is to advance their technical training (Koutedakis et al. 808).

Although the physical demands of modern dance have increased, the training has stayed with tradition (Clarkson 17). While modern dance continues to the push boundaries of physicality, the training follows the tradition of many generations handed down from one to the next. These traditions for training dance technique are seldom focused on developing athletic ability (Brown et al. 38). They have been proven to be insufficient (Rafferty 46; Allen et al. 7; Angioi et al., Fitness in Contemporary Dance 476; Beck et al. 7; Berardi 116; Brown et al. 44; Camp 1; Clarkson 43, Crookshanks 38; Fitt, Dance Kinesiology 388; Irvine et al. 1; Koutedakis et al., The Effects of Three Months Aerobic and Strength Training 811; Parrott 47; Rafferty 45; Redding et al. 91; Rodriguez-Krause and Krause 94, Rodriguez-Krause et al. 199; Watkins and Clarkson 8; Wilmerding and Krasnow 52; Wyon and Redding 74, Wyon et al., Time Motion and Video Analysis 854, Wyon et al., The Cardiorespiratory Responses to Modern Dance Classes 10), and are often not based in science (Hays 33). The desire for athleticism in dancers grows in the field of modern dance, yet there is an underlying controversy over whether or not dancers are athletes, and how training for athleticism may or may not be harmful to the aesthetic aspect of dance. Studies have found that dancers are lacking in muscular strength (Mistiaen 382) and cardiorespiratory endurance (Dahlstrom et al. 193), and should be more equipped for performance than they generally are (Brown et al. 38; Irvine et al. 1). This has created a gap between what is expected of the dancer in performance and how the dancer is trained. The

training of a dancer needs to develop in conjunction with the developing expectations of performance, meaning that aspects of tradition may need to fall away in order to make space for the necessary adjustments.

In order to fill this gap in dance training it is suggested that dancers supplement dance technique classes with cross-training (Bronner et al., “Differences” 18), which is any type of physical training other than dance. One source stated that an enduring and fruitful performance career requires physical fitness at its base (Beck et al. 1). For the last few decades the dance world has known about the benefits of cross-training for dancers to improve muscular strength (Koutedakis et al. 32), cardiorespiratory endurance, musculoskeletal imbalances (Wilmerding and Krasnow 52), recovery time (Angioi et al. Fitness in Contemporary Dance 482), and overall lifespan of career (Irvine et al. 1). Evidence of this knowledge exists in the works of many authors, (see works by Wyon, Redding, Fitt, Clarkson, and Stigleman for examples). This interest in supplemental conditioning for dancers dates back to 1966 (Bushey). Supplemental conditioning is needed in dance training, not only to prepare dancers for performance, but to prepare pre-professional dancers for professional careers (Bronner et al. “Differences” 18-19). "In addition to being technically skilled dancers must now be well conditioned" (Rodriguez-Krause and Krause 91). While the knowledge exists, and studies show, the increase in the performance ability of dancers who cross-train, there are still many dancers who do not add the elements of exercise science to their regimen (Ambegaonkar et al. 6). In order for dancers to achieve their full potential, physical fitness is an aspect of dance training that should not be overlooked (Brown et al. 38; Koutedakis and Jamurtas 658).

Many dancers refrain from participating in supplemental conditioning for reasons such as: lack of time, motivation, and access to equipment, as well as the many myths which have circulated within the dance world for years. The idea that a dancer's aesthetic can be compromised by exercise has been a myth that has discouraged dancers to participate in supplemental training (Koutedakis et al., "Effects" 808). Many dancers have believed that their muscles would increase in size if they lifted weights, which in turn would cause a loss in the range of motion (Fitt, "Conditioning" 32). Though this has been disproved (Koutedakis and Jamurtas 658; Mistiaen 387), the fable continues to be passed along from dancer to dancer, and instructor to student.

Dancers are often unable to cross-train due to limited access to space or equipment that is needed to properly exercise (Wyon and Redding 75; Vetter 718). Since dancers are trained mostly in a group or classroom setting, they are often unmotivated to train alone (Wyon and Redding 75). One of the biggest reasons dancers do not add supplemental training to their schedule is lack of time (Angioi et al., "Fitness" 475; Dahlstrom et al. 193; Grove et al. 70; Koutedakis et al. 29, Troy 47; Welsh 3; Wyon, "Cardiorespiratory" 10). Collegiate level dancers spend anywhere from three (Bronner et al., "Differences" 13) to six point four (Troy 46) hours per week in rehearsals in addition to sixteen and a half to twenty-one hours in technique classes (Bronner et al., "Differences" 13), not including academic courses. Professional dancers spend up to thirty hours a week in rehearsal and performance on top of seven and a half hours a week of technical training (Bronner et al., "Differences" 13). This shows that the extreme schedules of both professional and pre-professional dancers leave little time for supplemental exercise

(Bronner et al., “Differences” 18). These demanding schedules often result in overtraining, fatigue, and ultimately, injury (Wyon, “Preparing” 68).

A debate exists over how incorporating conditioning within the technique class may or may not affect the time to practice dance technique. For this reason many have recommended that conditioning is best done outside of the classroom on the dancer’s free time (Ambegaonkar et al. 6; Rodriguez-Krause and Krause 97, Wyon and Redding 75; Wyon et al., “Cardiorespiratory” 13; Crookshanks 38; Koutedakis and Jamurtas 658; Amorim 9). As noted previously, there are many reasons why dancers are unable to accomplish this task. In order to reap the benefits of supplemental training for dancers, without causing overtraining and fatigue, conditioning exercises need to become an incorporated part of the dance technique class (Berardi 141; Camp 3; Chatfield and Byrnes 103; Groer et al. 27; Irvine et al. 2; Rafferty 46; Vetter 718; Wyon, “Cardiorespiratory” 10). Taking some time out of the technique class to focus on conditioning is important, because it is the conditioning work that will support the technical aspect of the dancing. One source suggested that conditioning is more important than technique (Fitt *Dance*, 388), and another source stated that technique classes should be somewhat replaced by conditioning (Wyon, “Cardiorespiratory” 10). Some instructors are currently trying to incorporate conditioning into their technique classes, but very little has been written on how to do to this effectively and efficiently.

This thesis explores how to incorporate muscular strengthening and cardiorespiratory conditioning into the collegiate level modern dance technique class. Using information from previous literature on the subject of conditioning for dancers, in conjunction with interviews of dance professionals, a class was designed. The feasibility of the class design was tested in the

form of a workshop on dance majors at the University of California, Irvine. Participants of the workshop were surveyed for feedback that was used to improve the class design. The revised workshop was given to three separate groups of participants who were surveyed to conclude the study. This research may help to improve the fitness of collegiate level modern dancers allowing for better overall performance and injury prevention. Increased dancer health and performance may augment the probability of college dance graduates attaining professional positions.

CHAPTER TWO

The Benefit of Muscular Strengthening for Dancers

This chapter will describe the different types of strength training, and how they are beneficial to dancers. Information from literature on strength training for dancers will be incorporated. The topics of exercise intensity, exercise duration, and types of exercises will be discussed. These are important elements that will be used in Chapter Five on class design.

Under the umbrella of strength training there are three sub-categories: muscular strengthening, muscular power, and muscular endurance. Muscular strength is the ability to exert maximal force in one muscular contraction (Wilmerding and Krasnow 43). Muscular power is defined as the ability to exert a great amount of force quickly (Wilmerding and Krasnow 43). Muscular endurance refers to the ability to maintain force production for an extended period of time (Wilmerding and Krasnow 44). For example, in a weightlifting biceps curl exercise (an exercise where one holds a weight in their hand and lifts the weight by flexing at the elbow joint), a person must produce force from their biceps muscle to lift the weight. The ability to continue lifting the weight repeatedly for a long period of time is muscular endurance. In dance, the dancer's own body-weight is the resistance that must be overcome continually. Increased muscular endurance (Angioi, Do 106), muscular strength (Berardi 115), and muscular power (Angioi, Do 106; Berardi 115) are beneficial for dancers. Muscular endurance is needed in dancers to maintain muscular contractions throughout the entirety of the work they are performing. Dancers need muscular strength to lift other dancers, control their own body-weight,

or even to climb large set pieces. Muscular power is necessary for dancers to perform explosive movements like jumps.

In order to prove the need for supplemental training for dancers, studies have been done to investigate the relationship between fitness and dance. These studies have aided in finding how fitness is related to dance performance, whether or not dancers need to increase their fitness levels, and if additional strength training over dance training alone can improve dancer fitness. Many of the studies found positive correlations between strength training and dance performance.

Some studies have been done to find a correlation between fitness and aesthetic competence in dancers. Aesthetic competence in dance is the ability of the dancer to successfully meet the specified stylistic requirements of a dance genre. In two studies it was found that dancers who had muscular power of the lower-body, along with muscular endurance of the upper-body, also had aesthetic competence (Angioi et al., "Association" 122; Angioi, "Evaluation" 110). In addition to lower-body muscular power, more specifically jump ability, upper-body muscular endurance also indicated aesthetic competence in dancers (Angioi, Do 87). This shows that there is a strong correlation between a dancer's physical fitness and their capacity to successfully perform the specified aesthetic qualities of a dance genre. The physical fitness of a dancer is an important factor in their performance, and some aspects of fitness correlate more strongly than others.

One study found that the dancers who participated in supplemental training had increased levels of muscular power, muscular endurance, aerobic capacity, and aesthetic competence (Angioi et al., "Effects" 6). In a systematic review it was concluded that strength training can

improve both strength and aesthetic competence (Angioi et al., “Fitness” 483). This indicates a relationship between dancers who participate in supplemental strength training and performance ability. Further research on the relationship of physical fitness to specific performance abilities of dancers have found that muscular strength and power had a positive effect on performance (Girard et al. 239). Plyometric training, which falls under the category of muscular power, also had a positive effect on jump height (Girard et al. 239). Power and strength are two aspects of fitness that are most related to modern dance (Bushey 316). Dancers who participated in supplemental training found improvements in aspects of their dance performance (Parrott 62-63; Stigleman 123). This shows that there are positive correlations between supplemental strength training and dance performance.

Many studies with different areas of focus have found that strength training in addition to dance training is beneficial for dancers. One study compared traditional weight training to plyometric training and the difference in their effects on collegiate level dancers. It concluded that both were equally beneficial (Brown et al. 44). Another study was conducted in which they tested the effects of a strength and aerobic program on modern dance students (Koutedakis 808). Performance parameters such as muscular strength, cardiorespiratory fitness, and flexibility were improved with use of the supplemental training program (Koutedakis et al. 810). Another exercise program tested how endurance, motor control, and strength training done in addition to dance technique classes were effective (Mistiaen 385). These types of supplemental exercise were also found to be beneficial to pre-professional dancers (Mistiaen 385). A training program that lasted one year with ninety-minute classes, which included both fitness and dance-specific movement, produced increases in energy, jump ability, and the ability to endure technical

training (Redding et al. 91-94). This shows that the inclusion of supplemental strength training to a dancer's routine is beneficial in many ways. Improved muscular power (Bushey 316; Girard et al. 233; Rodriguez-Krause and Krause 93; Redding et al. 94; Rodriguez-Krause et al. 199; Vetter 178; Wilmerding and Krasnow 44) and muscular endurance (Fitt, Dance 288; Rodriguez-Krause and Krause 93; Redding et al. 94); Wilmerding and Krasnow 38), better range of motion, as well as increased ability to articulate and control movements are some of the ways strength training can be an asset to dancers (Wilmerding and Krasnow 38). Increases in energy (Redding et al. 94) and stamina (Berardi 115), as well as injury reduction (Ambegoankar 5-6; Amorim 9; Berardi 115; Groer et al. 27; Parrott 45) are important benefits that can occur with strength training.

Strength training can be accomplished in a number of ways. Sources suggested high intensity interval training, also known as HIIT, (Bronner et al., "Differences" 19; Rafferty 46; Rodriguez-Krause and Krause 98), along with plyometric or jump training, also known as explosive exercise (Brown et al. 44; Girard et al. 239; Irvine et al. 2; Wilmerding and Krasnow 44) to increase muscular power. Weight training (Brown et al. 38; Stigleman 123), circuit training, partnering (Irvine et al. 2; Wyon, "Cardiorespiratory Training" 9), eccentric contraction training (Rodrigues-Krause et al. 199), and Pilates (Amorim et al. 9) are ways to increase muscular strength. Many dance movements fall within these categories of exercise. Dance, when done with the appropriate amount of repetition and intensity, can elicit the desired muscular strength and power. For example, "holding the leg in extension" is a form of strengthening, while petite or grande allegro is an exercise for muscular power (Clippinger-Robertson 52). If repeated for a certain length of time, the exercise becomes an endurance exercise (Clippinger-Robertson 52). Dancers do not necessarily need to stop dancing to gain the same desired effects that come

from exercises such as push-ups and squats. Dance movements can be used to strengthen the body.

Dancers use their entire body to create shapes and movements of all kinds. Some muscles may be used more than others due to the repetition of specific movements. This can cause some muscles to become stronger than others leading to muscular imbalances, which can also cause injury. Two sources expressed that the upper-body is an area that dancers need to work on strengthening (Ambegaonkar 6; Irvine et al. 2). All other sources did not specify which muscle groups should be focused on, however one source offered that weak muscles should be prioritized (Koutedakis "Muscular Strength" 162). It was also suggested that muscle groups should be alternated during exercise in order to allow for recovery (Wilmerding and Krasnow 44). This suggests that all muscle groups deserve equal attention. The dancer's entire body is their tool. All muscles need to be equally balanced to refrain from injury.

In a dance technique class the length of time or number of repetitions of an exercise, also referred to as exercise duration, is usually based on musicality and choreography. The exercise duration tends toward the tradition of eight or sixteen repetitions, which fits easily within the common four/four meter of music. This focus on musicality and choreography, rather than duration for the aim of muscular strengthening, does not always elicit the needed muscular adaptation. Exercise duration is an important factor in muscular strengthening. As the body adapts to a specific duration, the duration will need to be lengthened in order to continue challenging the muscles. This is related to the principle of progressive overload which states that without the element of gradual progression of challenge, the body will not need to adapt and will not progress in physiological advancement (Wilmerding and Kkrasnow 42).

In the published literature, sources varied in recommended duration for muscular strengthening. The lowest number of repetitions suggested was four (Welsh 80), while the largest number of repetitions suggested was sixteen (Watkins 31). Sources gave ranges for repetitions such as: four to eight repetitions (Welsh 80), five to ten repetitions (Fitt, Dance 392), or eight to twelve repetitions (Wilmerding and Krasnow 44). Some sources did not give a range. One source advocated for just ten repetitions (Clippinger-Roberston 62). Others were less specific and simply stated that repetitions for dancers should be high (Koutedakis, "Muscular Strength" 161-162; Plastino 27). In addition to repetitions some concluded that repetitions be completed in sets. The source that recommended just ten repetitions, suggested only two sets for a total of twenty repetitions (Clippinger-Roberston 62). The source that found a mid-range of eight to twelve repetitions, supported two to three sets (Wilmerding and Krasnow 44), but the one that did not give specification for repetitions prescribed a total of eight sets of an exercise per muscle group (Peterson 387). These varied suggestions for exercise duration likely depend on the individual's fitness level. In the case of dance training where there is no external load, such as weights, the dance movement must be performed with enough intensity and repetition to produce muscular fatigue (Clippinger-Robertson 63).

Another way to aid in physiological adaptation is to change the level of intensity of an exercise. Intensity in exercise can refer to the energy level at which the exercise is performed, or the resistance that is used. It is the energy output of the body performing the task. In the biceps curl example used previously, the weight lifted by the biceps muscles can be increased to challenge the muscles toward the adaptation of strength. Due to the increased weight, the muscles will need a greater amount of energy output to overcome the weight against gravity.

There is very little access to exercise equipment in most dance studios, aside from the usual ballet barre. Due to this, dancers must use their energy output as a way to adjust intensity for physiological adaptation instead of relying on help from increased external load. Much of the research uses one-repetition maximum and percentages of the one-repetition maximum in regard to muscular strengthening with external load. External load refers to any type of equipment used, like hand weights for example. Dancers need to work at near-maximal efforts in order to achieve the same effect of external load (Rafferty 46).

In previously published literature there is not a consensus on the exact intensity levels that should be implemented for dancers. One source begins the low end of the range for intensity at sixty percent for muscular strengthening (Clippinger-Robertson 63). Two sources take the top of the intensity range all the way to one hundred percent, while another stops at ninety percent (Clippinger-Robertson 63; Irvine et al. 2; Wilmerding and Krasnow 47). Another reported eighty-five percent as the optimal percentage for muscular strengthening intensity (Peterson 378). Two of the sources were less specific determining that the work should be "physically demanding" (Plastino 27), and at a "challenging resistance" (Welsh 80). The advised intensities for dancers vary in range from sixty percent to one hundred percent. This shows that the effort given by dancers should be above mid-range to maximal in order to induce strength adaptations.

In conclusion, dancers can benefit greatly by incorporating all forms of strength training into their dance regimen. Dancers have been found to be less "physiologically robust" (Girard et al. 233) in comparison to athletes, and to have no more physical ability than that of a sedentary person (Koutedakis and Jamurtas 651). Dancers also endure a high rate of injury that can be reduced by the inclusion of strength training. In order to keep up with the current demands of

performance, dancers will need to spend more time focusing on improving levels of muscular strength, muscular power, and muscular endurance, which have been found to correlate with aesthetic competence in dance.

CHAPTER THREE

Cardiorespiratory Endurance Training for Performance

In addition to training their muscular system, dancers need to train their cardiorespiratory system. The cardiorespiratory system allows a dancer the ability to intake more oxygen in order to continue moving for extended periods of time (Wilmerding and Krasnow 48). It is important to train pre-professional dancers to have a greater capacity for oxygen consumption in order to perform longer works (Wilmerding and Krasnow 48). This chapter will detail the purpose and function of the cardiorespiratory system. The benefits of cardiorespiratory conditioning for dancers will also be covered. Information from literature on how to include cardiorespiratory exercise in the dance technique class will be included.

The respiratory system, the cardiovascular system, and the muscular system are the three bodily systems involved in cardiorespiratory activity (Stigleman 122). The term cardiorespiratory refers to both the cardiovascular system and the respiratory system. The term cardiovascular describes a system of the body made up of the heart (Fitt, Dance 255), blood (Martini 532) and blood vessels (Fitt, Dance 255). The respiratory system is made up of the nose, nasal cavity, sinuses, pharynx, larynx (Martini 635), rib cage, serratus muscles, intercostals, diaphragm, trachea, bronchial tubes, bronchioles, lungs and alveoli (Fitt, Dance 262). Together the cardiovascular and respiratory systems deliver oxygen to the muscular system through the blood (Wilmerding and Krasnow 38).

Cardiorespiratory endurance refers to the capacity of the body to continually provide oxygen to the muscles for a lengthened period of time (Wilmerding and Krasnow 48). Aerobic is

another term used to describe this type of exercise (Wilmerding and Krasnow 48). This refers to the pathway used for sustained muscular contraction (Martini 256). Dance is categorized as intermittent exercise (Wilmerding and Krasnow 47). This means that the intensity varies from slower, sustained movements to higher intensity, explosive movements (Wilmerding and Krasnow 47). Cardiorespiratory endurance training is important to dance training as it combats the onset of fatigue (Fitt, Dance 262), which can result in injury, therefore decreasing the injury rate (Parrott 47). The recovery process is expedited (Fitt, Dance 262) with increased cardiorespiratory endurance, so dancers need less rest time. Conditioning the cardiorespiratory system increases the size of the heart muscle and slows the resting heart rate (Fitt, Dance 261). This means that the system is able to work more efficiently at delivering oxygen to the muscles (Wilmerding and Krasnow 48). Cardiorespiratory endurance can increase a dancer's overall ability to perform at varied intensities for long periods. It is a necessity to have this type of training as a basis for dance training (Wyon et al. "Cardiorespiratory" 7). The intensity of rehearsals and performances make aerobic endurance training essential (Wyon and Redding 75). Supplemental cardiorespiratory training alongside regular dance training can benefit dancers by improving overall aerobic fitness (Angioi, Do 2), therefore it is vital to improving performance (Wilmerding and Krasnow 48).

Training the cardiorespiratory system can be achieved by using a constant pattern for an extended period of time to move the larger muscle groups of the body (Wilmerding and Krasnow 48). There are many types of exercises that can be used to do this, for example jogging and swimming (Wilmerding and Krasnow 48). The important aspect of this type of training is that it must be continual (Fitt, Dance 395). One way to achieve this in dance is to use a center dance

combination that is done continuously (Plastino 27). This could be done within a dance technique class (Plastino 27). Many dance technique classes finish the last twenty to thirty minutes with a center combination. The instructor could choreograph the end of the combination to connect to the beginning of the combination in a seamless manner. This would make it so that the dancers do not have to stop as they usually would between each attempt at the dance combination. Instead, they would continue without stopping, making this section of class more of a cardiorespiratory challenge.

It is important to pay attention to the level of intensity at which an exercise is taking place. As mentioned in the previous chapter, if the intensity is not high enough the needed adaptations of the body may not be achievable. If the intensity is too high, it could have negative repercussions. Whatever the chosen intensity, exercise, and repetition, it needs to increase over time in order to continue to create adaptation within the body (Rafferty 46). Sources vary in proposed intensity for cardiorespiratory conditioning. A range from fifty-five to one hundred percent is stated as the optimum intensity for cardiorespiratory conditioning (Wilmerding and Krasnow 47; Irvine et al. 2; Welsh 97; Wyon, “Cardiorespiratory Training" 9; Fitt, *Dance* 392).

Another way of rating intensity is through the use of a rate of perceived exertion scale (RPE). This is a psychophysical scale with which an individual can subjectively calculate the intensity of the exercise demands (Ritchie 62). This is often used when equipment such as heart rate monitors are absent or unavailable. The scale most commonly used is the Borg scale (Ritchie 62). This scale begins at six, which symbolizes no exertion, and goes up to twenty, which symbolizes maximum exertion (Ritchie 62). It has also been adapted to a one-to-ten scale. Both have been found to be reliable (Ritchie 62). One source stated that an RPE of fourteen to

seventeen for cardiorespiratory training in dancers is best (Wyon, "Cardiorespiratory Training" 9). This would be approximately six to eight on the modified Borg scale, which falls within the suggested exercise intensities as previously discussed.

Another important factor to exercise is the duration. Just as the intensity level can aid in achieving the necessary goals of exercise, so can the length of time spent doing it. As mentioned earlier, dance studios are not generally equipped with exercise apparatuses such as free weights, so increasing the intensity or difficulty of exercise through use of external load is not always an option. Due to this fact intensity and duration must be adjusted to challenge the body for physiological adaptation. Many sources agreed that a minimum of twenty minutes of cardiorespiratory exercise is required in order to be effective (Fitt, Dance 395; Irvine et al. 2; Koutedakis and Jamurtas; Welsh 97; Wilmerding and Krasnow 47; and Wyon, "Cardiorespiratory Training" 9), but sources disagreed on the maximum. Some sources placed the top of the range for cardiorespiratory activity at thirty minutes (Fitt, Dance 395; Welsh 97), while others extended the top of the range to forty minutes (Irvine et al. 2; Wilmerding and Krasnow 47; Wyon, "Cardiorespiratory Training 9). Some sources explained that aerobic activity should be sustained (Welsh 97) for the duration, but others advocated for abbreviated segments such as one to sixty-second intervals (Wilmerding and Krasnow 47), or three and six-minute intervals during the session (Wyon "Cardiorespiratory Training" 10; Chatfield and Byrnes "Cardiovascular Aspects" 103). Since dance is categorized as intermittent type exercise (Berardi 141; Bronner et al. "Preseason" 82; Chatfield et al. 24; Dahlstrom et al. 107; Rodriguez-Krause and Krause 93; Rodriguez-Krause et al. 199; Wyon et al. "Cardiorespiratory" 3), it would be dance specific to train dancers using interval type cardiorespiratory exercises, but dancers need to be prepared for

performances which may require sustained activity. To train for long performances, continuous cardiorespiratory conditioning would be beneficial, or intervals that continue for a lengthened period of time.

In order to begin to fill the gap between dance training and performance, it is necessary that cardiorespiratory endurance practice combined with strengthening becomes a regular part of training for dancers. Cardiorespiratory conditioning can develop a dancer's capacity to intake oxygen, and more efficiently deliver it to the body (Wilmering and Krasnow 48). Other benefits include delayed fatigue, faster recovery (Fitt, *Dance* 262), and decreased injury rates (Parrot 47; Wilmerding and Krasnow 47). Training the cardiorespiratory system can be done through the use of many types of exercise, but the most important factor is that the exercise continues for a minimum of twenty minutes as suggested by the literature reviewed. During this period the movement can be done in intervals, usually performed at a higher intensity with short rests, or at a slightly lower intensity with sustained movement. Whatever the chosen method, interval or sustained, the activity must be at near-maximal effort and prepare the dancer for performance.

CHAPTER FOUR

How Professionals Work To Fill The Gap

Though very few works of literature examined the application of exercise science to the dance technique class, many dance professionals recognize the need for its implementation. Some instructors have already begun to incorporate supplemental training into their teaching. In order to design a collegiate level modern dance technique class incorporating muscular strengthening and cardiorespiratory conditioning, interviews were conducted. Dance instructors who have taught collegiate level modern dance and supplemental training practitioners who have worked with dancers participated in answering questions regarding the types of exercises that should be included in dance technique classes, as well as specifications for duration, intensity, and order of the activities. Interview questions also determined what challenges the instructors had when adapting conditioning within a technique class, and what common areas of weakness were noticed by supplemental training practitioners. These interviews aided in identifying the common themes for use in the class design.

Methodology for Interviews

Upon receiving approval from the Institutional Review Board (IRB), an IRB approved recruitment notice was posted using the social media platform of Facebook (see Appendix A). The announcement was also sent via email to colleagues in the dance field to share with, or refer, potential interview participants. Interested participants were sent an IRB approved study information sheet and encouraged to ask questions regarding the study (see Appendix A). Interview participants were interviewed in person at a location of their convenience using IRB

approved questions (see Appendix B and Appendix C). Participants signed release forms, which also approved the use of an IRB approved audio recording device (see Appendix A). Two sets of interview questions were used based on the category the participant belonged to. Six interviews were conducted in total. Two of the participants fell into the category of supplemental training practitioners who have worked with dancers (Interview Participants 5 and 6), and three fell into the category of dance instructors who have taught modern dance at the collegiate level (Interview Participants 1, 3, and 4). There was one participant who fell into both categories and was asked both sets of interview questions (Interview Participant 2). After completing each interview the audio was transferred to a password protected laptop computer.

Instructors

Interview Participants 1 and 4 taught at four-year universities. Interview Participants 2 and 3 taught at community colleges. Interview Participant 2 was also a certified Pilates instructor. The instructor interview questions were asked with the goal of identifying the types of exercises, as well as specific exercises, the instructors used within their technique classes. The aim was to find the number of repetitions or duration of each exercise, as well as the intensity at which the exercises were performed. Questions were also asked to discover the challenges the instructors faced when trying to add conditioning into technique classes, how they overcame those issues, and why they have found it important to incorporate such activities into technical practice.

As discussed in Chapter Two, muscular strength, power, and endurance are needed in contemporary styles of modern dance. Strength is needed in order to support one's body-weight or the weight of others. Muscular power is needed to perform explosive movements like jumps.

To maintain the ability to produce energy from the muscles for the duration of a performance, muscular endurance is also needed. All of the instructors interviewed incorporated strengthening into their modern dance technique classes at the collegiate level.

Every one of the instructors interviewed included some form of push-ups for upper-body strengthening in their technique classes. Interview Participants 1 and 4 used Yoga-based exercises such as the sun salutation (a series of Yoga movements), which includes upper-body exercises like downward dog (an exercise where one places their hands and feet on the floor with their hips in the air) and push-ups (an exercise where one places their hands and feet on the floor with their hips in-line with their shoulders, and lowers their body toward the floor by bending the elbows). Interview Participant 4 used triceps or plank push-ups (a push-up where the elbows are held close to the body) within a Yoga routine to strengthen the upper-body. Interview Participant 4 also used push-ups out of the context of Yoga. With first year students, Interview Participant 4 spent more time working on push-ups than with older students. This was done in order to teach the first year students how to work on their own. These push-ups were done using different arm positions, such as wide placement of the hands to target the pectoralis muscles, and narrow placement of the hands to intensify the focus on the triceps muscles. Both Interview Participants 3 and 4 incorporated arm movements other than Yoga and push-ups for upper-body strengthening. Some of the arm movements included follow along dance routines with isometric holds. This shows that instructors found value in strengthening the upper-body for dancers. They believed the use of push-ups, Yoga-based exercises, and other arm movements were useful toward the end of upper-body strengthening.

All instructors, except for Interview Participant 2, included some form of core strengthening. The core refers to the muscles circling the midsection of the body. The abdominals and lower back muscles are a part of the core or what is called the powerhouse in Pilates (Siler 194). Both Interview Participants 1 and 2 used Yoga-based exercises as an efficient way to strengthen both the core and upper-body using one routine. Interview Participant 4 specified that three-legged dog was a Yoga exercise they used to strengthen the core. This is an exercise where one begins in a downward dog position, then lifts one leg and brings the knee to meet the opposing elbow. Interview Participant 3 used Pilates-type exercises to the aim of core strengthening. The Pilates core exercises included the hundred (an exercise where one lies on their back and lifts their shoulders off the floor with varied leg positions while pulsing arms coordinate with the breath), abdominal series, single and double leg stretch (an exercise where one lies on their back and lifts their shoulders off the floor to flex the torso while either extending one leg or both legs and coordinating the arms and breath), and criss cross (an exercise where one lies on their back and lifts their torso extending one leg and bringing the other leg's knee to meet the opposite elbow). Instructors found core strengthening to be an important supplement to dance training. They used both Yoga and Pilates-based exercises to achieve the goal of core strengthening.

A lot of time in technique classes, especially more traditionally based classes, is spent in verticality with a focus on the use of the legs. Due to this, dancers tend to have more strength in their legs than other regions of the body. This may be why few instructors focused conditioning exercises on the lower-body. Instructor Interview Participant 3 included the Pilates leg series for strengthening of the lower-body, and Interview Participant 4 included lower-body conditioning

exercises focused on the gluteal muscles. Based on this, it shows that some instructors have found it important to continue strengthening the lower-body, while other instructors chose to spend conditioning time focused on the abdominals and upper-body.

As discussed in Chapter Three, cardiorespiratory endurance is needed for dancers to have the ability to efficiently intake oxygen in order to perform longer works. Dance instructors have noted this and have been including cardiorespiratory training in their technique classes. All instructors interviewed incorporated cardiorespiratory conditioning into their modern dance technique classes at the collegiate level. Dance phrases and improvisation were used for cardiorespiratory training. Interview Participant 1 gave their students a traveling movement phrase to use for cardiorespiratory conditioning. Interview Participant 2 gave students intermittent cardiorespiratory activities. Interview Participant 4 used improvisation toward the goal of cardiorespiratory conditioning as it did not require lengthy explanation to begin. This was included in the middle of the class, or as an extension of the warm-up approximately thirty minutes into the class. Other times, Interview Participant 4 used improvisation in combination with the dance phrase at the end of the class to create continuous activity for cardiorespiratory endurance training. Interview Participant 1 also used the end of class dance combination as a tool for cardiorespiratory conditioning. All instructors found it necessary to prepare their students for the cardiorespiratory needs of dance performance. They used traveling phrases or dance combinations and improvisation to improve cardiorespiratory fitness in dancers.

In regard to the duration of exercise, Interview Participant 1 stated that the Yoga-based routines were repeated three to five times, or for approximately four minutes. Interview Participant 4 had fewer repetitions than Interview Participant 1 with only two to three repetitions,

but their Yoga series lasted almost twice as long as that of Interview Participant 1 at seven to eight minutes. Interview Participant 4 had students complete four repetitions of push-ups for four sets, and two repetitions for another four sets. Other times they used sixteen push-ups with a break and another set of eight push-ups as the format. Interview Participant 3 also included four sets of four push-ups, while Interview Participant 1 used the length of a two to three-minute song. Within this timeframe students were expected to do as many push-ups as they were able to. Interview Participant 3 also used a two to three-minute song for arm exercises. Three to five repetitions of Yoga, sixteen push-ups, and two to three minutes of other arm exercises were the common durations for strengthening exercises among dance instructors.

Durations for cardiorespiratory training were much longer than that of strength training. Interview Participant 1's cardiorespiratory phrase was repeated in cycles, three times each cycle with rest in between. The amount of time for the rest was not defined as it was given while another group did the phrase, so the rest lasted only as long as it took the next group to do the routine. This cardiorespiratory training session lasted for a total of fifteen minutes. Interview Participant 2's cardiorespiratory training intervals lasted thirty to forty-five seconds with thirty seconds of rest in between for a duration of twelve minutes. Interview Participant 4 stated that their improvisation and dance combination used for cardiorespiratory training may last up to forty-five minutes. Interview Participants 3 did not specify the length of their improvisational cardiorespiratory warm-up. Based on this feedback the duration of cardiorespiratory training may last between twelve and forty-five minutes in length.

Pushing to fatigue was another common concept among dance instructors. Interview Participant 3 explained that the duration of the exercise should result in fatigue. Pushing the body

past its comfort zone will cause the body to adapt and change. It was also commonly acknowledged that the length of the exercises was dependent upon the fitness level of the specific group. Interview Participants 1 and 2 emphasized that whatever the number of repetitions the students began with, the important factor was that of progression from the start to the end of the term. In teaching a dance class each student may begin at a different fitness level. This means they may not all be able to reach the same end point by the conclusion of a term. Because of this, it is important to focus on the growth of the individual, rather than a set goal for the entire class.

Dealing with varied fitness levels was one of the challenges shared by dance instructors. They felt that the varied fitness levels related closely with the common challenge to motivate the students to participate in conditioning activities. Ensuring that the exercises were done safely with proper alignment was also a common challenge. Both Interview Participants 1 and 3 reported that they dealt with the challenge to motivate their students. They agreed that lack of motivation in students may have been due to the varied fitness levels. Students may have felt that the work was either too easy or too hard. Interview Participant 1 dealt with varied fitness levels by allowing the students to set their own starting point. Interview Participants 2 and 4 expressed that the starting point should be discovered by each individual's unique abilities, and that the goal should be to increase their abilities over time. Both Interview Participants 3 and 4 offered variations, progressions, and regressions of exercises to the students to either challenge the student further if the exercise was too easy, or to make the exercise easier if needed. Interview participant 3 also allowed students to take breaks if the exercises were too difficult. In contrast, Interview Participant 4 offered the option of performing exercises at double speed in order to

increase the difficulty. Lack of motivation in students may have also been due to lack of experience and knowledge to perform the exercises correctly. Interview Participants 2 and 3 both agreed that teaching correct execution of the exercises was a difficulty they faced. Interview participant 3 approached alignment issues by asking the students to execute conditioning exercises in neat rows. This allowed the instructor the ability to easily spot any wavering alignment issues. Allowing students to begin at a place that was challenging enough for their personal fitness and knowledge level by offering progressions and regressions of exercises was a useful solution to gaining participation of students.

Another challenge of incorporating conditioning into the technique class is deciding where best to place it in the structure of the class. It is important that dancers receive a proper warm-up, and that technical training does not suffer from fatigue, or lack of time, due to the inclusion of conditioning. All of the instructors interviewed chose to use conditioning training as a way to warm-up. Interview Participant 1 did Yoga, flexibility, and core exercises choreographed into the plié exercise during the warm-up. Interview Participant 2 placed cardiorespiratory conditioning at the end of the warm-up. Interview Participant 3 explained that "conditioning is a continuation at the end of warm-up." This instructor taught a continuous warm-up that students did not have to memorize. They simply followed along as the instructor demonstrated the exercises. Interview Participant 3 included arm exercises approximately six minutes into the start of the warm-up, and abdominal exercises at either the end or the beginning of the warm-up. Similar to Interview Participants 1 and 3, Interview Participant 4 incorporated Yoga, core, and arm exercises into the warm-up. Interview Participant 4 incorporated did not want the goal of the exercises to be to fatigue, but rather to activate the muscles for use later in

class. For example, Interview Participant 4 stated that it was important to activate the arms in preparation for use during inversions used later in the class, but was careful not to fatigue the arms due to possible risk of injury. Interview Participant 4 highlighted that they often saved time at the end of the class to work on specific muscles or exercises with the goal to fatigue, because at the end of class the muscles no longer need to be saved for technical work. Many times this was aimed more toward the first year students in order to show them the importance and emphasis on strengthening in hopes that they would continue the work outside of class. Instructors found the warm-up portion of the technique class to be one of the best ways to incorporate conditioning into technical practice time. The conditioning exercises can be used to activate the muscles in preparation for the technical work to come, but instructors need to be careful not to fully fatigue the muscles, so that they are still useful for dance practice.

No matter how they chose to include conditioning practice into the technique class, all of the instructors interviewed agreed that it is an important necessity for a variety of reasons including: injury prevention, performance preparation, strength, and muscular control. Interview Participants 1, 2, and 4 all made mention of the importance of injury prevention for career longevity. Interview Participant 1 declared that, "The amount of dancing in class is insufficient to keep injury free." In regard to performance, Interview Participant 2 noted, "There is a shift in what dancers are required to do." Therefore, dancers need to be strong, have the ability to hold the weight of other dancers, and to have muscular control (Interview Participant 4). Interview Participant 1 also reasoned that students will need to be prepared with enough stamina to perform longer form works. Interview Participants 1 and 4 agreed that dancers will find importance in what is emphasized in class. They say, if an instructor does not spend time in class

working on conditioning, students will believe that conditioning is unimportant. Therefore, instructors should emphasize conditioning in hopes that students will continue to do it on their own. In order for these elements of exercise science to become a part of dance training, "we need to break tradition" (Instructor Interview Participant 3) as these instructors have already begun to do.

Supplemental Training Practitioners

Interview Participants 2 and 5 were certified Pilates instructors. Interview Participant 6 was certified in Structural Integration (SI/Rolf Method) a form of bodywork that combines soft tissue manipulation with movement. All of these supplemental training practitioners were dancers who practiced their techniques on other dancers. The aim in questioning supplemental training practitioners was similar to that of dance instructors. The goal was to find out what types of exercises they think dancers should include in their regimen, in addition to the intensity and duration of activity, as well as what areas of the body supplemental training practitioners noted as common problems.

Supplemental training practitioner interview participants were asked what, if any, common issues they noticed when working with dancers (see Appendix C). Common issues referred to areas of weakness, muscular imbalance, and inadequate knowledge of bodily function. Identifying common weaknesses can help to resolve the issues. Interview Participant 6 found that there was a common weakness in the lower-body. They specified, "I don't think a lot of people are trained to go to the ground and to utilize that ability." Interview Participant 5 elucidated that the lower-body weaknesses were found in the hamstrings, adductor muscles, hip, foot, and ankle. It was noted in the previous section that some instructors spent less time with a

focus toward strengthening the lower-body due to the assumption that it was already strong enough. This insight from supplemental training practitioners shows that the assumption of strong lower-body muscles in dancers may have been incorrect. In order to become stronger, or to maintain a certain level of strength, the muscles must continue to be challenged with strength training.

In relation to the concept of muscular weakness, muscular imbalances were also found in the lower-body. Interview Participant 5 communicated that muscular imbalances of the knee joint were common in dancers. Muscular imbalance refers to the idea that one side of the body is stronger than the other. For example, one might have weak erector spinae muscles on the right side of the body, and stronger erector spinae muscles on the left side of the body. This could cause the skeleton to be pulled out of alignment. In this example the torso might lean slightly to the left. This is a problem, because the body is a chain. One weak link could cause another area to go out of alignment resulting in pain and/or injury.

Dancers need to understand their bodies, how they work, and how to properly prepare for performance. This information needs to be transferred from instructor to student. Interview Participant 2 noted an overall lack of understanding in the dancers they worked with. According to Interview Participant 2, “People are trying to do crazy moves, without having the goods to back it up, without really understanding how their body might do that, and also what strength is required, and then actually doing the strength training required to make it happen safely” (Interview Participant 2). This supplemental training practitioner included lack of strength and cardiorespiratory training, lack of awareness of the body, lack of proper alignment, and lack of knowledge in how to move safely as common issues seen in dancers.

The inclusion of conditioning exercise in dance training is a way to help dancers improve their abilities and knowledge in order to decrease the level of injuries sustained. Supplemental training practitioners used exercises from their areas of expertise to supplement dancers' training. Interview Participant 5 conveyed that exercises that support the joints should be given to dancers in technique classes. They claimed that exercises for the inner thigh done in parallel or external rotation should be included in technique classes. "Side lying clam" (an exercise where one lies on their side with both legs bent and externally rotates the top leg at the hip joint), long-lever lifting the whole leg in both internal and external rotation (an exercise done lying on the side with the top leg straight lifting it up and down), or single leg balances (an exercise where one stands on one leg) were suggested for gluteal exercises. Exercises using a band or single leg relevés (an exercise where one rises up on their toes) were suggested for foot and ankle strengthening. The bridge exercise (an exercise where one lies on their back with their knees bent and feet flat on the floor while lifting their hips up and down) was recommended for the hamstrings. Most of the exercises this practitioner suggested focused on the lower-body, except for curls (an exercise where one lies on their back and lifts their shoulders off of the ground to flex their torso) or bicycles (an exercise where one lies on their back and brings one knee to meet the opposite elbow and alternates sides) with a neutral pelvis for the abdominals. This related to this practitioner's concern with muscular imbalances of the knee joint in dancers. These are exercises that may help to stabilize the lower-body, especially at the hip and knee. Interview Participant 5 referred to "longevity of career without pain" as what can be gained from the inclusion of the exercises listed above for joint support.

Interview Participant 2 did not give specific exercises, but explained that "increasing the dimensionality of the exercises that we're already doing, so that they flexibly adapt to a wide range of movements that might occur in an actual choreographed piece" is what needs to be done in a dance technique class. This practitioner gave the example of variations of the plank. The plank is an exercise done by placing the hands and feet on the ground while isometrically holding the body flat with the hips in-line with the heels and head. This exercise already has several variations. Continuing to manipulate exercises such as this to become more dance specific is at the root of what this practitioner believes would be useful toward the end goal of dance conditioning. They stated that this type of work is important "to adapt to the athleticism that is needed for current day modern."

Interview Participant 6 reported earlier that dancers lack strength in their lower-bodies, and have a lack of training in how to ascend from and descend to the floor. To begin to remedy this weakness and misunderstanding, this practitioner said that a visualization exercise where one imagines the heels rooting into the ground should be included in the beginning of a dance technique class. This concept of grounding would later aid in jumping and falling. This practitioner argued for groundwork by stating that, "People tend not to be into their feet. If you don't have that base, everything else above that would become out of alignment."

Duration and intensity are the variables of exercise that need to be managed in order to create physiological adaptation in the body. Supplemental training practitioners weighed in on how much energy to exert and how long to perform conditioning exercises. Interview Participants 5 and 6 agreed that duration should vary dependent on the fitness level of the group. Interview Participant 5 specified that instructors should gauge duration based on the mid-range

fitness level, or slightly above mid-range fitness level, of the group. This supplemental training practitioner also indicated that duration should be dependent on how long the students are able to maintain proper form, and that the focus of the exercise should be on form and intensity. Interview Participant 5 used a rate of perceived exertion scale of one-to-ten, with the aim of the exercise at a seven. Interview Participant 2 agreed with instructors in the idea that whatever the chosen duration, the goal should be to increase over time, given that the body needs to be challenged in order to cause adaptation, as mentioned previously, due to the principle of progressive overload (Wilmerding and Krasnow 42).

Supplemental training practitioners had similar views as instructors on the placement of exercise within the dance technique class. Supplemental training practitioners also agreed that strengthening and cardiorespiratory conditioning should become an extension of the warm-up. They introduced the idea that conditioning exercises could be layered or interspersed throughout the technique class. Interview Participants 5 and 2 recommended that strengthening happen after the warm-up. Interview Participant 5 specified that it should be done before technical dance exercises. Interview Participant 2 recommend that cardiorespiratory training be done near the beginning of class and also interspersed throughout the class. Interview Participant 3 suggested that exercises be layered throughout the class. This supplemental training practitioner explained that the exercises should be more dance specific, choreographed into the class and flowing into each successive exercise. Using conditioning as a continuation of the warm-up is a popular suggestion among dance professionals, but the idea of gradually building the conditioning throughout the class is also suggested.

The importance of conditioning work for dancers was not lost on professionals in the field of supplemental training. Many of them teach supplementary conditioning classes, such as Pilates, and privately work with dancers on their personal supplemental training plans. They responded positively to the idea of dance instructors incorporating this work into the technique class. Supplemental training practitioners cited lack of motivation, noted earlier as a common challenge for dance instructors, as a reason for the importance of the inclusion of conditioning into dance technique classes. Interview Participant 5 said that the lack of motivation to practice conditioning work on one's own is why it is important for instructors to include it in the classroom. Interview Participant 6 explained that lack of motivation to participate in conditioning work is due to the boring manner in which the exercises are usually taught. Many dancers view "plain exercise," like repetitions of push-ups or sit-ups, as uncreative and dull. This is the reason why Interview Participant 6 suggested the idea of integrating exercises throughout the class in a more dance-specific, or choreographed way. When exercises are altered to look and feel more like dance, they become more relatable and inspiring to dancers as compared to simple exercise.

Interview Participant 5 noted the intense schedules of dancers as another reason for the inclusion of conditioning in technique classes. In order to get dancers to include the proper strength and cardiorespiratory training needed to reduce injury and improve performance, conditioning work within the class may be the necessary solution to gain dancer participation in supplemental exercise. Dancers tend to "brush aside injury" (Interview Participant 4). Injury prevention is one of the main reasons to include conditioning within the technique class (Interview Participant 3).

In conducting these interviews, it was found that college level modern dancers should condition all areas of the body. There was not one specific area of the body that needed more attention than others. Some participants emphasized the upper-body, and some emphasized the lower-body or core. Pilates and Yoga-based exercises were commonly used, as well as push-ups and other arm exercises, in addition to cardiorespiratory exercises. Repetitions for Yoga exercises varied from two to five. Push-ups had the common number of sixteen total repetitions. Other arm exercises varied from two to eight minutes in length. Cardiorespiratory training was done from twelve to forty-five minutes. Most agreed that the duration of exercise should be based on the ability of the group, rather than specified numbers of repetitions, and should increase over time in order to reach successful muscular or cardiorespiratory adaptation. Other ideas for consideration were: working near the mid to top level of fitness range of the class, allowing for rest and variations, and pushing to fatigue while maintaining form. Instructors and supplemental training practitioners agreed that it is important for the safety and longevity of career that instructors incorporate conditioning into the technique class. In order to help prevent injury, as well as emphasize the importance of conditioning for dancers, including cardiorespiratory and strength training in collegiate level dance classes is needed.

CHAPTER FIVE

Combining Exercise Science and the Experience of Dance Professionals

After conducting a review of literature and completing interviews, the next step in the process toward class design was to find common themes. Based on all of the information collected from literature and interviews common themes were identified and combined (See APPENDIX D) to create a workshop design. As stated in the previous chapter, ideas that were found in common among professionals included the goals of upper-body, lower-body, and core strengthening, as well as cardiorespiratory conditioning. Push-ups were commonly used by professionals to strengthen the upper-body and many used sixteen repetitions or the duration of a two-minute song. Yoga-style exercise was commonly used by professionals as a way to strengthen dancers, and many repeated these types of exercises between three and five times. It was commonly found that the durations were dependent on the class. Lack of motivation and poor alignment due to varied fitness levels were common challenges faced by instructors. Most recommended using variations on exercises to progress or regress students as needed. Instructors commonly found that applying these ideas to the warm-up section of the technique class was the easiest way to condition students without taking away from the technical aspect of dance training. Cardiorespiratory conditioning was commonly incorporated into the warm-up or end combination for a duration of twelve to forty-five minutes. Common themes from literature included: dance-specific movement, near-maximal effort, high repetitions, gradual increase and decrease of intensity, continuous movement, intervals, circuits, plyometric exercise, twenty-

minute minimum for cardiorespiratory endurance training, aerobic before anaerobic exercise, large muscles before small muscles, one-to-one work-to-rest ratio, and low-intensity active rest.

Common Themes Combined

The first common theme was dance-specific movement. Dance-specific movement refers to the principle of specificity (Wilmerding and Krasnow 41). This principle explains that exercise needs to reflect the goal (Wilmerding and Krasnow 41). In the case of exercise toward the goal of performing concert dance, the exercise needs to imitate the actions of the body in dance (Wilmerding and Krasnow 41). The actions of the conditioning exercises must emulate the same range of motion, intensity, and duration as in dance (Wilmerding and Krasnow 41). Dance-specific movement that relates to the style of dance or desired result is a key component to effective conditioning for dancers (Fitt, Dance 389; Plastino 26, Welsh 65; Wyon, "Cardiorespiratory" 9). Sources explained that the warm-up should prepare for the upcoming needs of the class (Fitt, Dance 389; Irvine et al. 2; Rafferty 46; Welsh 65). Other sources stated that dance movement such as a dance combinations, partnering work, or even a basic movement like a relevé can be used to train cardiorespiratory endurance and strength (Clippinger-Robertson 52; Irvine et al. 2; Watkins 83). Interview Participant 2 and Interview Participant 6 both suggested that the exercises need to relate to the desired abilities of the dancer. Dance-specific movement can be interpreted in two ways. It can be an exercise that is useful for dance or relates to a specific musculature used in a specific dance movement, or is closely related to codified dance steps. It can also be interpreted as dance movements used as exercises, or exercises made to look like dance movements.

Near-maximal effort and high repetitions were themes that shared a similar idea. Within the areas of both cardiorespiratory conditioning and strength training, it was commonly stated that a work intensity should be above seventy percent (Wyon, "Cardiorespiratory" 9; Koutedakis, "Muscular" 162; Irvine et al. 2) to near maximum (Clippinger-Robertson 63; Chatfield and Byrnes 103; Irvine et al. 2; Koutedakis, "Muscular" 162; Peterson 387; Rafferty 46; Welsh 97; Wilmerding and Krasnow 47; Wyon, "Cardiorespiratory" 9). Interview Participant 5 explained this by stating that dancers should work at a seven on the one-to-ten scale. As mentioned in Chapter Two, in the case of dance training where there is no external load such as weights, dance movement must be performed with enough intensity and repetition (Koutedakis, "Muscular" 161-162; Plastino 27) to produce muscular fatigue (Clippinger-Robertson 63).

Keeping the class moving was a theme that was prevalent in literature on cardiorespiratory training (Fitt, Dance 395; Plastino 27; Welsh 97). Continuous movement was also suggested for the warm-up (Irvine et al. 2; Rafferty 47; Welsh 65), overall structure of the class (Plastino 27), and duration of the exercise (Clippinger-Robertson 52). This continuous activity is useful in elevating the heart rate, and keeping it elevated for the suggested twenty-minute minimum, also commonly found in literature (Fitt, Dance 395; Koutedakis and Jamurtas 653; Wilmerding and Krasnow 47; Wyon, "Cardiorespiratory" 9). Interview Participant 4 suggested this idea of continuous motion in their idea of combining improvisation with the dance combination in order to keep the class continuous. Interview Participant 2 also suggested this concept with their interval-type cardiorespiratory circuits where the class used active rest to maintain motion during rest periods. Instructors used a range from twelve to forty-five minutes

for cardiorespiratory training, making the common overlap between literature and interviews twenty minutes.

Interval training is exercise that is done in short bursts separated by brief rest. Circuit training (Wyon, "Cardiorespiratory" 9; Irvine et al. 2) and plyometric exercise, or power exercises, (Clippinger-Robertson 52; Irvine et al. 2; Wilmerding and Krasnow 44) fall under the category of interval training and were also suggested types of exercise for dancers. High intensity interval training is dance specific in that dance is an intermittent type of exercise (Rafferty 46; Wilmerding and Krasnow 86, Rodriguez-Krause and Krause 98; Chatfield and Byrnes 103). Dance often requires small segments of intense movement followed by moments of pause.

As mentioned above, rest plays a role in exercise. It gives the body the opportunity to recover before beginning another exercise bout. Themes related to rest were revealed within the literature. One-to-one work-to-rest ratio is one type of rest suggested by literature (Rafferty 46; Wyon, "Cardiorespiratory" 10). This is when the time spent exercising is equal to the time spent resting. An example of this was given by Interview Participant 1 who allows dancers to rest during cardiorespiratory training while others take one turn at attempting the cardiorespiratory exercise. Active rest (Wyon, "Cardiorespiratory" 10; Irvine et al. 2) was another type of rest suggested. Active rest is a low-intensity exercise that is done during the rest period to keep the body warm and moving. As previously mentioned Interview Participant 2 used this type of rest during cardiorespiratory intervals.

Gradual progression was another theme found within the literature. The progression of difficulty and intensity from the warm-up (Fitt, Dance 389; Plastino 26; Welsh 65) through the

entire structure of the class (Fitt, Dance 391; Plastino 27) was an important factor. This aids in the preparation of the body to do the more intense work ahead. In contrast, the cool-down gradually decreases in intensity and difficulty (Fitt, Dance 389; Welsh 68-69). Just as in preparing the body to be properly warm for the work ahead, the cool-down helps to gently return the body back to a resting state. Interview Participant 6 also suggested this idea of building on or layering ideas throughout the class. Other key components of class structure are related to the idea of energy expenditure based on models for exercise progression (Ratamess et al. 692). It was recommended that aerobic exercise be done before anaerobic exercise (Koutedakis, "Muscular Strength" 162; Wilmerding and Krasnow 47), and large muscle groups be exercised before small muscle groups (Koutedakis, "Muscular Strength" 162; Watkins 35; Wilmerding and Krasnow 44). The idea behind this is that the most difficult exercises should be performed first, while the body is less fatigued (Koutedakis, "Muscular Strength" 162). Larger muscles require more energy to use than small muscles, and cardiorespiratory activity requires more energy than strength training. Attempting to perform these activities in the opposing order might result in ineffective exercise or injury. This is because the full amount of energy needed for the more difficult exercise will no longer be available as some of the energy has been already used for the less difficult exercise.

In terms of areas of the body to focus on, all areas were regarded as important. The upper-body was one common focus for dance instructors as well as in literature (Ambegaonkar 6; Irvine et al. 2; Watkins 183- 191, 232-236). Current trends in modern dance involve movements in and out of the floor with the upper-body as the cushion for impact or force for ascending. Inversions, movements where the body is completely inverted using the arms as the

base of support, are also popular. Upper-body strength is needed to safely accomplish these tasks. The core and legs are also emphasized as important areas of the body for successful modern dancing (Plastino 67; Watkins 83-85, 132-139). Interview Participants 1, 2, 3, and 4 suggested exercise for the core as well. A strong core is needed for spinal articulation and support. It is also considered to be the area of the body that drives power. Strength in the legs is needed to jump and balance. Interview Participants 3, 4, 5, and 6 also suggested lower-body exercise. While some sources placed more emphasis on one area more than another, the accumulation of information from all sources shared no one focus. All body parts were mentioned at some point. This reveals that all areas of the body are considered important in dance. The areas to focus on are the areas that are going to be used (Rafferty 46). This is similar to the idea of dance-specific movement in that all movement is fair game in modern dance. Choreography in modern dance contains a variety of ways of moving the body. This explains why no one area of the body should be considered more important than another area of the body.

The following ideas are the combined themes from both the literature and the interviews: one-to-one work-to-rest ratio, continuous movement, gradual increase and decrease of intensity, large muscles before small muscles, aerobic movement before anaerobic movement, full-body conditioning, variations and options for students, dance-specific movement, active rest, twenty-minute minimum cardiorespiratory training, Pilates Method, Yoga-style exercise, plyometric exercise, sixteen repetitions of push-ups or two minutes of arm exercises, and near-maximal intensity.

Workshop Design

While trying to incorporate as many of the common themes into the workshop design as possible, the following four main goals were chosen: 1) continuous movement, 2) dance-specific movement, 3) near-maximal intensity, and 4) full-body workout. These were chosen, because they were the most common themes within the literature and interviews, and were also ideas that could encompass some of the other themes. Using these four main goals for the workshop, the ideas of gradual increase and decrease of intensity, large muscles before small muscles, variations and options for students, twenty-minute minimum cardiorespiratory training, Pilates Method, Yoga-style exercise, plyometric exercise, and push-ups were included (see Table 5.1).

Table 5.1: Workshop #1 Class Design

TIME	EXERCISE	BEATS PER MINUTE	EXERCISE INTENSITY
Section #1 WARM-UP (1:00 - 5:00), 5 min.	Improvisation	70 - 118 bpm	2-6 on a scale of 1-10
(0:00 - 1:00), 1 min.	rolling, slow	70 bpm	2
(1:00 - 2:00), 1 min.	push/pull, weight into the hands, moving slowly	82 bpm	3
(2:00 - 3:00), 1 min.	weight into the legs, push/pull, moving slowly	94 bpm	4
(3:00 - 4:00), 1 min.	weight into the hands, push/pull, faster	106 bpm	5
(4:00 - 5:00), 1 min.	weight into legs, push/pull, faster	118 bpm	6
Section #2 MUSCULAR STRENGTH AND CARDIORESPIRATORY CONDITIONING (5:00 - 25:00), 20 min.	2 Phrases	118 -181 bpm	7-10 on a scale of 1-10
(5:00 - 15:00), 10 min.	Phrase #1 - Large muscles	118 - 181 bpm	7-10
(15:00 - 25:00), 10 min.	Phrase #2 - Small muscles	118 - 181 bpm	7-10
Section #3 COOL-DOWN (25:00 - 30:00), 5 min.	Improvisation	118 - 70 bpm	6-2 on scale of 1 -10
(25:00 - 26:00), 1 min.	weight into the legs, push/pull, moving quickly	118 bpm	6
(26:00 - 27:00), 1 min.	weight into hands, push/pull, moving quickly	106 bpm	5
(27:00 - 28:00), 1 min.	weight into the legs, push/pull, moving more slowly	94 bpm	4
(28:00 - 29:00), 1 min.	weight into the hands, push/pull, moving more slowly	82 bpm	3
(29:00 - 30:00), 1 min.	rolling, slow	70 bpm	2

The allotted thirty minutes for the workshop needed to include the following elements: warm-up, muscular strengthening, cardiorespiratory conditioning, and cool-down. In order to include all aspects, it was decided that five minutes at the beginning and end of the class would be set aside for warm-up and cool-down. There needed to be twenty minutes minimum of cardiorespiratory exercise, leaving only ten minutes for warm-up and cool-down. Splitting the time evenly meant that warm-up and cool-down were allotted five minutes each.

There were many concepts found in common between literature and interviews, but only some of them were incorporated into the class design. Aerobic movement before anaerobic movement, one-to-one work-to-rest ratio, sixteen repetitions of push-ups, and two minutes of arm exercises were the few ideas excluded from the design. Due to the time constraints it would not be possible to include both a warm-up and cool-down as well as twenty minutes of aerobic movement separate from an anaerobic workout. For safety purposes the warm-up and cool-down could not be extracted from the class design, and the twenty-minute minimum of cardiorespiratory exercise would need to simultaneously include strength training in order to fit both within a thirty-minute workshop. This meant that the concept of aerobic before anaerobic exercise would not be included in this particular class design. Also due to time constraints, it would not be possible to give the same amount of rest as work as in the concept of one-to-one work-to-rest ratio within a thirty-minute continuous workshop. Lastly, the exercises needed to be incorporated into dance phrases, and needed to be taught and performed within a ten-minute period. The number of repetitions executed was dependent on how quickly the participants were able to learn the dance phrases, how many times the dance phrases were performed, and how

many times the participants did the exercises while learning the phrases, therefore it was not possible to maintain the specific repetitions and durations of the arm exercises.

To aid in the goal of keeping the class continuous, two active-rest exercises were chosen as part of the class design. These exercises were high knees, and boxers (see Appendix E: 5.1). They were chosen, because they were easy to teach and learn quickly, and did not take up a lot of space. Participants would have been able to use these exercises when they needed an opportunity to rest, while waiting on the side of the room for their turn to dance, or even while watching the instructor demonstrate. The high-knees exercise was an exercise where one alternated lifting one leg up at a time bringing their knee as close to their chest as possible. This exercise was chosen because it could be progressed or regressed. It could be done with a hopping action as one switches between legs, or could be regressed to a slower option where there was less impact, done as a march in place. Boxers were an exercise in which one shifted weight from one leg to the other while keeping the feet close to the floor. This could also be done with a hop when switching from one leg to the other for progression, or with a step-touch action to regress.

In order to encourage intensity based on heart rate, it was decided that the music should be manipulated to mimic the desired beats-per-minute of the heart. An iPhone was used to play the music during the workshop, and a phone application called Tempo Magic (Lolo), which allowed the adjustment of the tempo of music based on beats-per-minute, was downloaded to be used in the class. Since the average resting heart rate is approximately seventy beats-per-minute (Clark et al. 72), it was decided that the warm-up would begin with the Tempo Magic application set at seventy beats-per-minute as well. This was decided based on the idea that the workshop participants would likely begin at a resting state. The maximum heart rate was calculated using

the formula two hundred and twenty minus the age (Melone) for college-aged students, eighteen to twenty-two years old. The maximum heart rate for a twenty-two year old, the top age range of the average college student, was one hundred and ninety-eight beats-per-minute. This was used as the maximum beats-per-minute for the music. It was later discovered that the Tempo Magic application would adjust no higher than one hundred and seventy-eight beats-per-minute. This meant that one hundred and seventy-eight beats-per-minute had to be the maximum beats-per-minute used for the music. All incremental changes to the music depended on that maximum. The music was adjusted incrementally throughout the class to increase gradually along with the warm-up, to near-maximal intensity, and back to resting with the cool-down. It was determined that the increments would increase by twelve in order to reach the desired beats-per-minute maximum and return to the starting beats-per-minute within the timeframe of thirty minutes. In addition to the music tempo application, a modified Borg scale of one-to-ten for rate of perceived exertion was used. The instructor explained the concept of the scale at the beginning of the class, and verbally communicated where their energy level should have been throughout the class.

Since the workshop participants would not have had any previous opportunity to learn the workshop material for Workshop #1, it was decided to use a guided improvisational warm-up and cool-down. This would have allowed for all of the allotted warm-up and cool-down time to be used with the participants in motion toward the goal of continuous activity, rather than having to stop to learn choreography. Improvisation is also a common technique used in modern dance classes, which made this dance specific.

The warm-up increased gradually in the movement style, movement intensity, and beats-per-minute of the music. It increased continuously each minute of the five-minute warm-up. The

first minute of the warm-up was a guided improvisation of rolling movements traveling across the floor (see Appendix E: 5.2). Utilizing the idea of gradual build in intensity, the dancers were asked to work at a low level of intensity of a two on the rate of perceived exertion scale of one-to-ten, with ten being the maximum intensity. The music was set at seventy beats-per-minute. The second minute of the workshop changed to a guided improvisation of pushing and pulling movement taking the weight into the hands and traveling across the floor (see Appendix E: 5.3). The rate of perceived exertion for this activity was a three with the music set at eighty-two beats-per-minute. Continuing with this concept, the push and pull action progressed with weight into the legs for one minute at an intensity of four with the music set at ninety-four beats-per-minute (see Appendix E: 5.4). The next minute was at an intensity of five with the music set at one hundred and six beats-per-minute. The dancers were guided to move their weight back into their hands, continuing with pushing and pulling at a more vigorous rate (see Appendix E: 5.5). The rate of perceived exertion increased to a six with the music set at one hundred and eighteen beats-per-minute. This last movement of the warm-up changed back to the mode of using the legs (see Appendix E: 5.6). The intensity was allowed to increase in both energy and speed dependent on the dancers perception of intensity level.

The cardiorespiratory and strength training combined middle section of the class was split into two dance combinations using the concept of large muscles before small muscles. The first combination was designed with a focus toward strengthening the larger muscles of the body, while the second combination focused on the smaller muscles. The twenty-minute section of the class was split evenly giving ten minutes a piece for each dance combination. The intensity for both combinations was set to work at near maximum for the entire time. Seven to ten was the

intensity for the dance combinations toward the goal of near-maximal effort. Using the rate of perceived exertion scale allowed the dancers to work at their own fitness level. The music increased incrementally by twelve from one hundred and eighteen beats-per-minute to the maximum of the Tempo Magic application at one hundred seventy-eight beats-per-minute. The dance combinations were taught in small parts adding on with dancers following along in order to keep the class continuous for cardiorespiratory endurance.

The first dance combination for the large muscles focused on the chest, back and upper-leg area (see Appendix E: 5.7-5.8). The main muscles included in these areas are: pectoralis major, rhomboids, latissimus dorsi, gluteal muscles, quadriceps, and hamstrings. Current trends in modern dance utilize a lot of floor work where the dancer is required to lower and raise their body in and out of the floor using their hands. In order to address the muscles responsible for this type of movement, push-ups and similar pushing movement was included to work the chest. The muscles of the back work eccentrically to aid in the action of lowering to the floor. They are also primary muscles for modern dance movements like inversions. To strengthen the muscles of the back, back extension or superman type exercises (an exercise where one lies on their stomach and lifts their torso off of the ground without using their hands, often with the arms extended past the head) were used to work the back extensors, along with a diamond push-up in the Yoga downward dog position to eccentrically work the latissimus dorsi. The diamond push-up is an exercise done in the downward dog position where one bends their elbows out to the sides lowering their head toward the floor. Many styles of modern dance require the dancer to be weighted into the floor using a bent knee position. This activates the hamstrings and quadriceps of the legs. These muscles are also vital to jumping, balancing, and lowering to the floor, which

are movements used in modern dance and also use the gluteal muscles. Plyometric jump lunges and squats were included in the movement combination in order to strengthen the muscles of the legs. A jump lunge is an exercise where one has one leg in front of the other and bends both knees to a ninety degree angle, then jumps from that position and either switches their legs in the air or lands the same way as they started. Squats refer to an exercise where one bends their knees from a standing position with the legs about hip-width apart for a sitting action.

The second phrase of movement focused on smaller muscles of the body such as the biceps and triceps muscles of the upper-arm, and the abdominal muscles (see Appendix E: 5.9-5.10). While these muscles are considered smaller muscles of the body, this does not mean that they are less important. The main action of the biceps muscles are to bend the elbow, while the main action of the triceps muscles are to extend the elbow. These two sets of muscles work together to push and pull aiding larger muscles of the body like the chest and back. In addition to the floor work mentioned above, this is also useful for partner work. Partnering is an important aspect of many styles of modern dance. Body-weight biceps curls were included in this phrase to strengthen the biceps muscles along with dips to strengthen the triceps muscles. The body-weight biceps curl is an exercise where one lies on their side with their legs bent and stacked on top of one another. They then grab behind their knees with their hands and pull their torso off the ground to be supported by the bottom elbow. They lower themselves back to the floor and repeat the movement. A dip is an exercise where one places their hands behind them from a seated position with their legs bent and feet flat on the floor. They lift their hips toward the ceiling and bend their elbows to work the triceps muscles. The abdominal muscles are a part of what is considered the core of the body. These muscles flex in the sagittal plane, rotate and laterally flex

the torso. Modern dance often uses varied movements of the spine. The abdominal muscles are a part of creating these actions in the body with the help of the back muscles. The abdominal muscles also stabilize the spine and help to support balance. To work the abdominal muscles, both Pilates Method and Yoga-style exercises were used while moving through the modern dance technique of Bartenieff floor work. The v-sit, which is called a teaser in Pilates, was incorporated for strengthening the rectus abdominis muscles as well as the internal and external obliques of the abdomen. This is an exercise where one flexes the body at the hip joint lifting the torso and legs off of the floor to balance on the sacrum for a moment and then returns to lying on the floor. The Yoga-based plank position pulling the knee to the elbows cross-laterally and ipsilaterally was incorporated to strengthen the internal and external obliques as well as the transverse abdominis muscles of the abdomen.

After the twenty-minute section of cardiorespiratory and muscular strengthening movement phrases were completed, the class finished with a five-minute cool-down. The cool-down used the same guided improvisation, intensity, and beats-per-minute of music as was used in the warm-up. The only difference was that the music was changed to bring a more calming mood as the class came to a close. From minute twenty-five to twenty-six, the first minute of the cool-down, the dancers were directed to move quickly, improvising pushing and pulling actions of the legs (see Appendix E: 5.11). The music was set at one hundred eighteen beats-per-minute, and the intensity level for participants was set to six. The rate of perceived exertion changed from the near-maximal levels of seven to ten and gradually decreased back to where the class started at a two. In minute twenty-six to twenty-seven, the second minute of the cool-down, the dancers were guided to shift their improvisation to focus on pushing and pulling quickly with the

hands (see Appendix E: 5.12). Their intensity lowered slightly to five, and the music changed to one hundred and six beats-per-minute. During the third minute of the cool-down, the dancers were directed to change back to the pushing and pulling with the legs improvisation (see Appendix E: 5.13). This time they were moving at a slower rate with an intensity level of four on the one-to-ten scale. The music slowed to ninety-four beats-per-minute. During the fourth minute of the cool-down, minute twenty-eight to twenty-nine of the workshop, the dancers were directed to shift their improvisation back into pushing and pulling with their weight in their hands at an intensity of three (see Appendix E: 5.14). The music slowed to eighty-two beats-per-minute. Lastly, the dancers were directed to move into the floor with a rolling improvisation at the starting level of two on the one-to-ten scale (see Appendix E: 5.15). The music reached its last change at seventy beats-per-minute.

In conclusion, the thirty-minute workshop design was centered around four main goals; to keep the class continuous, to use dance-specific movement, to address the entire body, and to work at near-maximal intensity. Active-rest exercises (boxers and high knees) were included in the class design toward the goal of continuous movement. Side lunges, single-leg balances, push-ups, downward dog, inversions, jump-lunges, squats, body-weight biceps curls, dips, Pilates teasers, and Yoga-style planks were exercises used to strengthen the entire body. The music was adjusted to beats-per-minute based on the approximate age and target heart rate of participants using the Tempo Magic application. This was done to aid in motivating participants toward the goal of near-maximal intensity in addition to the use of a one-to-ten rate of perceived exertion scale. Additional themes from literature and interviews such as gradual increase and decrease of intensity, large muscles before small muscles, variations and options for students, twenty-minute

minimum cardiorespiratory training, and plyometric exercise were included in the workshop design. Due to the time constraints of the workshop, the themes of aerobic movement before anaerobic movement, one-to-one work-to-rest ratio, sixteen repetitions of push-ups, and two minutes of arm exercises were not included.

CHAPTER SIX

Practical Application of the Class Design

In order to test the feasibility of the class design, the workshop was conducted with college dance majors at the University of California, Irvine. Participants were surveyed (see Appendix F) for feedback after the first workshop. Based on the information acquired from surveys, video recording, and the instructor's personal pedagogical experience, adjustments were made to the class design for feasibility testing in the second workshop, which was given on three separate occasions. Participants were surveyed again (see Appendix G) after the second workshop in order to make conclusions regarding the practicality of conditioning dancers within a dance technique class.

Methodology for Workshops

With IRB approval, recruitment notices were posted on designated posting spaces around the University of California, Irvine campus within the Claire Trevor School of the Arts (see Appendix A). The social media platform of Facebook was also used to post recruitment notices within the Facebook group titled UCI Dance Majors (see Appendix A). Interested parties were given an IRB approved study information sheet and encouraged to ask questions regarding the study (see Appendix A). Participants signed release forms, which also approved the use of IRB approved video recording (see Appendix A).

Workshop #1

The first workshop was held in late fall of 2017. Ten dance majors participated. Prior to the start of the workshop, participants were given a brief explanation of the goals of the

workshop, as well as the format of the class and what to expect. Participants were notified that the workshop included a warm-up and a cool-down, and used the four commonalities: continuous movement, dance-specific movement, near-maximal effort and full-body exercise. Participants were encouraged to practice safety in their participation. This was done by asking participants to acknowledge their level of ability and any pain or discomfort they may feel, as well as to take the necessary precautions to adjust the movement or ask the instructor for help. Students were also asked to notify the workshop instructor of any pre-existing injuries before the start of the class. The rate of perceived exertion scale was described, and participants were given two exercises to use when resting to keep the rest active.

Instructor Findings

The lead researcher was also the instructor for the workshops. The following paragraphs explain the strengths and weaknesses of teaching strength and cardiorespiratory training within a thirty-minute dance technique workshop from the instructor's perspective. This information is important as it aids in understanding how successful the elements of the workshop were in order for others to adapt these ideas to their own teaching.

The goal of the warm-up was to make it continuous with gradual progression using movement related to dance. The aspects of the warm-up that were successful were getting the participants moving quickly, and the type of music used. Using guided improvisation as a tool for warm-up made it so movements did not need to be taught, only directed, so lengthy explanation was unnecessary. The music was chosen for its lighthearted feeling to help motivate participants as the warm-up progressed.

Areas for improvement in the warm-up of the first workshop were the use of space, the length and cues of each progression, the volume of the sound, and the legibility of the notes on beats-per-minute of the music. The participants were asked to turn around during the traveling warm-up in order to continue the guided improvisation in the opposite direction without waiting for the last person to finish crossing the dance floor. Since there were only ten participants in the class, the traveling aspect of the exercise turned out to be unnecessary (see Appendix E: 5.2-5.6). There were not enough participants for anyone to be waiting on the side. During the one-minute guided improvisation progressions, it was noticeable that the participants looked as if they were losing interest. This meant that the length of time spent on each progression needed to be changed, or that more cues needed to be given. The style of the music used for the warm-up worked well, but was a little loud causing the participants to look up to question what they were supposed to be doing. It was also difficult to constantly adjust the beats-per-minute during the one-minute guided improvisation intervals. This may have been due to little practice with using the Tempo Magic application. In addition, the notes on beats-per-minute were too small to read quickly (see Appendix H). This made it difficult as an instructor to keep guiding the class while trying to adjust the music. The warm-up music needed to be kept at a lower level for the second workshop to enhance the overall communication in the classroom. The notes on the beats-per-minute needed to be made larger and clearer for the instructor to see quickly. This would have made it so the instructor would have been able to adjust the music more easily while maintaining guidance of the students.

The goal of the dance combinations was to make the movement continuous using dance related exercise to increase muscular strength, power, and endurance, as well as cardiorespiratory

endurance. The goal was also to work the dancers at near-maximal intensity while training the entire body. The first combination aimed at exercising the large muscles of the body (see Appendix E: 5.7-5.8), while the second combination focused on the smaller muscles (see Appendix E: 5.9-5.10). Both of the dance combinations were successful at incorporating dance-specific movement for muscular strengthening and cardiorespiratory conditioning using dance-related movement at near-maximal effort. Areas for improvement included the concepts of continuous movement and full-body exercise. Other weak elements included instructor cueing, as well as the biceps exercise and music tempo in the second combination.

The active-rest exercises (see Appendix E: 5.1) used for continuous activity did not work as planned. The movements used for the dance combinations (see Appendix E: 5.7-5.10) took place mostly on the floor, while the active-rest exercises were meant to be done standing. This made it difficult for participants to easily transition into active rest while learning the movement phrases. One of the active-rest exercises needed to be changed so that it could be done on the floor.

In the first combination (see Appendix E: 5.7-5.8), the strengthening of the right versus the left sides of the body was uneven. The combination was taught on the right side to begin with, so the participants were able to reverse the choreography quickly and easily for the left side. The problem with this methodology was that the participants repeated the phrase more times on the right than on the left, because of the amount of times they did it while learning the phrase. To remedy this problem the phrase needed to be changed to incorporate both sides more evenly within the combination, rather than doing it all on one side and then the other. Another solution would have been to teach small sections of the choreography on both sides. A third

option would have been to change the warm-up to incorporate more of the movement from the combination, so that the participants would have already learned some of the choreography. This would have made the learning portion shorter with less repetitions from learning, and more repetitions from doing the full phrase on both sides. This would have made the repetitions and strengthening more even on both sides of the body.

The instructor found difficulty in giving physical corrections. Most of the cues were given verbally to the group, rather than individual tactile corrections. Trying to demonstrate, as well as work the sound, made it difficult for the instructor to give individual feedback. This may have been due to the design of the notes used by the instructor (see Appendix H), which stated the correct changes in tempo. The notes needed to be made clearer for the instructor to see quickly and easily.

Many participants struggled to perform the biceps exercise (see Appendix E: 5.9-5.10) correctly in the second combination. Some participants did not have their elbow correctly placed directly under their shoulder, and struggled to lift their torso properly. This exercise needed to be changed to a different exercise to work the biceps muscles in order to be sure that everyone participating was able to perform the exercise properly.

The piece of music used for the second combination (see Appendix E: 5.9-5.10) worked in terms of style, but was too fast at one hundred and thirty beats-per-minute. It was noticeable based on their form that the dancers were struggling to complete the movements at that tempo. The beats-per-minute needed to be adjusted to a slower pace within the range of correct intensity, at a minimum of one hundred eighteen beats-per-minute, in order to allow for the full range of motion in the exercises.

The goal of the cool-down was to gradually decrease the intensity using continuous dance-specific movement in order to return the dancers to a resting state. This was done through traveling guided improvisations (see Appendix E: 5.11-5.15). The cool-down was successful in decreasing intensity at a gradual pace that moved continuously over the five-minute period, but did not achieve the goal of returning participants to full rest. The traveling aspect of the cool-down design, which was found ineffective in the warm-up, was not used. In addition, the music was ineffective at aiding the gradual decrease in energy.

The failure of the cool-down to return the dancers to resting was due to the length of the cool-down. It was not long enough to bring the participants back to a resting heart rate. It was noticeable that the participants were still breathing heavily at the end of the cool-down. The intervals for the guided improvisation regressions needed to be changed so that the beats-per-minute slowed at a larger increment, and held at that increment for a longer period.

During the cool-down portion of the class the concept of progressing across the room was changed to staying in the center of the space. This was done based on the ineffectiveness found of this use of space during the warm-up. Keeping the dancers in the center of the room rather than traveling made it so the dancers were able to find their own space to move in without having to be concerned with others.

The music for the cool-down was also found to be ineffective. The music was too intense in regard to the quality of the movement for this particular section. Even though the music was adjusted to slower beats-per-minute, the cool-down section of class needed to have a piece of music that was more calming.

Based on heart rate monitoring of the lead researcher, the workshop was successful at incorporating cardiorespiratory exercise. While the participants were not tested on physiological changes during the workshop, the lead researcher wore a heart rate monitor (Timex Ironman digital heart rate monitor) while teaching in order to get an idea of the ability of the workshop to induce cardiorespiratory conditioning. The maximum heart rate of the lead researcher was determined to be one hundred and eighty-seven by subtracting two hundred and twenty from the age. About an hour before the start of the class the lead researcher's resting heart rate was noted to be seventy-three. In the middle of the workshop the heart rate was at one hundred and seventy-nine beats-per-minute, which is approximately ninety-six percent of the heart rate maximum exhibiting that near-maximal intensity was achieved during the halfway point of the workshop. At the end of the workshop the heart rate dropped to one hundred and eight beats-per-minute demonstrating the cool-down was effective in lowering the heart rate, but not able to bring it to a resting state.

In summary the instructor found some of the elements of the class design to be successful. The goal of continuous activity was achieved in the warm-up and the cool-down, dance-specific movement was used successfully throughout the entire class, and the goal of near-maximal effort was successful. The goal of full-body exercise was somewhat less successful due to uneven repetitions of the dance combinations on both sides of the body. The majority of the main four goals were successful. Some finer details could have used improvement in order to make the class run more smoothly allowing for continuous movement throughout, and full-body exercise.

Workshop #1 Survey Results

Immediately following the workshop, participants were asked to fill out a survey of fourteen questions. The survey used a one-to-ten scale and comments for responses (see Appendix F). The questions were asked to define whether or not the class successfully met the goals of integrating muscular strengthening and cardiorespiratory conditioning into the workshop from the perspective of the student. The questions strived to determine if the ideas of the four main goals were accomplished, and if variables such as music and RPE scale were found to be useful.

The first question was, "How sufficient was the warm-up to prepare you for the class activities that followed?" (see Appendix F). The goal of this question was to discover whether or not the dancers felt prepared by the warm-up for the movement combinations. The majority of participants chose eight and ten on a one-to-ten scale with ten representing the most sufficient (see Figure 6.1). Two participants noted that they had come directly from a technique class, so they were warm prior to the start of the workshop. Two participants commented that they did not feel physically prepared by the warm-up for the later movement in the workshop. One participant explained they did not prepare themselves during the guided improvisational warm-up for the level of intensity or types of movements used in the combination. In order to better prepare all participants for the dance combination, it needed to either be demonstrated or explained at the start of the class. This would have allowed participants to have in mind what they were preparing for as they moved through the guided improvisation. As mentioned in the previous section on instructor findings, the warm-up could have also incorporated movement from the dance combinations. This would have made the warm-up more structured, helped to teach the

combination more quickly, and made the repetitions even on both sides of the body. Incorporating movements from the combination into the warm-up would have helped to ensure that dancers who felt unprepared for the combination were better readied. This would have also helped to give more of a structured warm-up to the participants, and fixed the problem of the improvisations being too long.

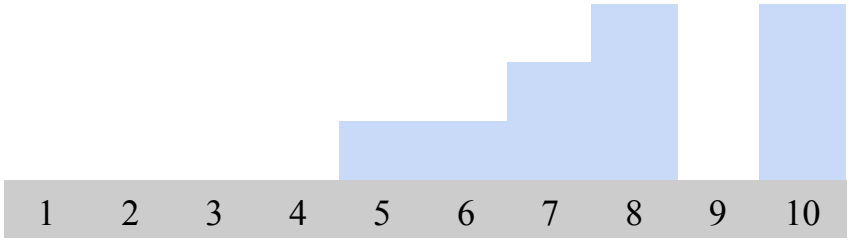

Figure 6.1 The response to Question #1 on the Workshop #1 Survey regarding the sufficiency of the warm-up. The response of ten reflected the choice of "very sufficient," and the response of one reflected the choice of "not sufficient."

The second question on the survey was aimed at finding out whether or not the class successfully met its goal of continuous activity (see Appendix F). On a scale of one-to-ten with ten representing the flow of the class being the easiest, the majority of students chose between eight and ten on the scale (see Figure 6.2). This shows that they felt the class transitioned smoothly from one section to the next. One participant noted that the active-rest exercises interfered slightly with the flow of the class, and another participant felt that the flow was better during the warm-up and cool-down than during the dance combinations. The active-rest exercises needed to have been adjusted to be more useful during the learning of the dance combinations. The combinations used a lot of floor work, and as mentioned above, an active-rest exercise that could have been done on the floor would have been more suitable.

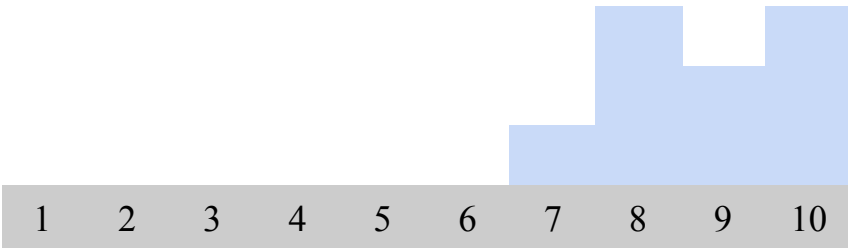

Figure 6.2 The response to Question #2 on the Workshop #1 Survey regarding how easily the class flowed from one segment to the next. The response of ten reflected the choice of "very easily," and the response of one reflected the choice of "not easily."

Questions three, four, and five revolved around the musical aspect of the workshop. These questions were aimed at finding how the chosen music worked with each section of the class and whether or not it aided in motivation (see Appendix F). Question number three on the survey asked "How effective was the music used in class?" Results showed that the majority of participants chose a ten on the one-to-ten scale with ten representing the most effective (see Figure 6.3). Many participants commented that the music matched the mood and movement of each section, and some participants included that the music was motivating. Question number four asked "How suitable was the music for the exercises?" Just as in the previous question, the majority of participants chose a ten on the scale representing that the music was very suitable (see Figure 6.4). Question number five asked, "How effective was the music at helping to motivate you?" Again, most participants chose a ten on the one-to-ten scale with ten being "very effective" (see Figure 6.5). One participant commented that the music motivated them to continue even when they were feeling fatigued. According to these results the music was motivating and suitable to the movement. No changes to the music needed to be made based on these results.

Figure 6.3 The response to Question #3 on the Workshop #1 Survey regarding the effectiveness of the music. The response of ten reflected the choice of "very effective," and the response of one reflected the choice of

Figure 6.4 The response to Question #4 on the Workshop #1 Survey regarding the suitability of the music for the exercises. The response of ten reflected the choice of "very suitable," and the response of one reflected the choice of "not suitable."

Figure 6.5 The response to Question #5 on the Workshop #1 Survey regarding the effectiveness of the music to motivate participants. The response of ten reflected the choice of "very effective," and the response of one reflected the choice of "not effective."

Question number six was asked with the goal of discovering how effective the instructor was at cueing the exercises (see Appendix F). The majority of participants chose nine on the scale with ten representing "very effective" (see Figure 6.6). Participants commented that the reminders to keep moving were useful, as well as the demonstration and explanation of the movement. One participant comment explained that the rate of perceived exertion scale was helpful and motivating, but two participants commented that they found this less helpful and even confusing. In order to make the rate of perceived exertion scale more useful to all participants, it needed to have been made into a visual scale.

Figure 6.6 The response to Question #6 on the Workshop #1 Survey regarding the effectiveness of the cues given by the instructor. The response of ten reflected the choice of "very effective," and the response of one reflected the choice of "not effective."

Questions seven and eight were aimed at finding how well the workshop incorporated muscular strengthening and cardiorespiratory conditioning (see Appendix F). The majority of participants chose a ten on the scale for effectiveness of incorporating muscular strengthening (see Figure 6.7) and nine for cardiorespiratory integration (see Figure 6.8). Many participants commented that they could feel their muscles being worked in multiple areas. Others felt the focus was mostly on the upper-body and core. One participant stated that the arms felt worked, but that the legs could have used more exercise. In terms of cardiorespiratory endurance, many participants felt their heart rate increasing throughout the class. One participant stated that to move the entire time was challenging, but it was this continuous element that made the cardiorespiratory training effective. Another participant explained that it was the active-rest exercise that made the continuity possible, but also recommended a floor exercise for active rest. These results showed that the participants felt the conditioning of both the muscular and cardiorespiratory systems were successfully incorporated. Improvements could have been made to challenge the legs further toward the goal of full-body exercise, and to change the active rest to include a floor exercise for easier use toward the goal of continuous activity.

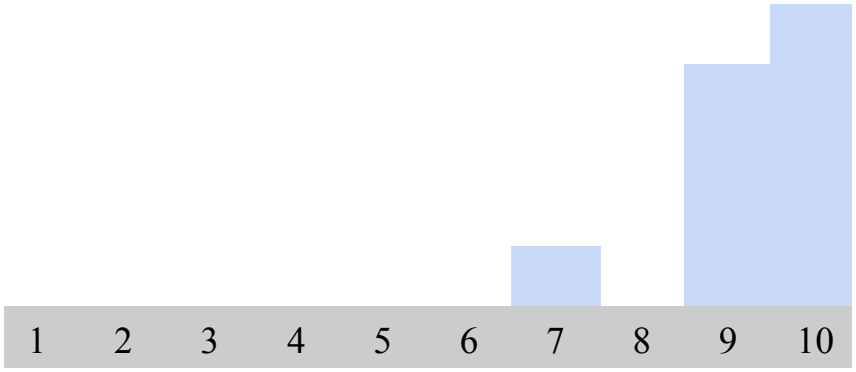

Figure 6.7 The response to Question #7 on the Workshop #1 Survey regarding how effectively strength training was integrated within the workshop. The response of ten reflected the choice of "very effective," and the response of one reflected the choice of "not effective."

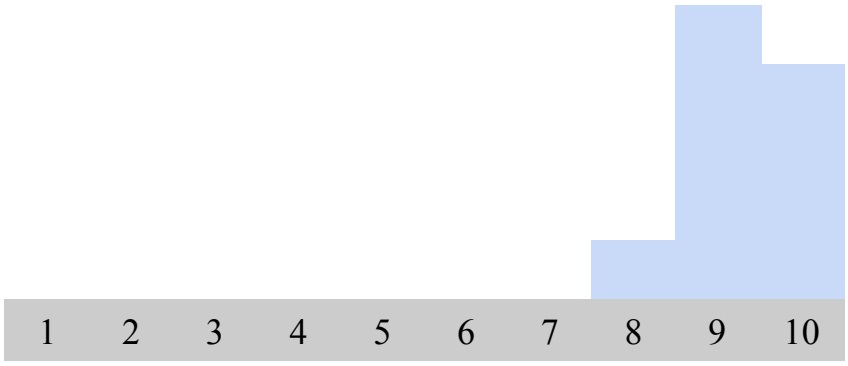

Figure 6.8 The response to Question #8 on the Workshop #1 Survey in regard to how effectively cardiorespiratory training was integrated into the workshop. The response of ten reflected the choice of "very effective," and the response of one reflected the choice of "not effective."

Questions nine and ten were designed to find how challenging the movement phrases were in order to know if they were useful toward the goal of near-maximal intensity (see Appendix F). The majority of participants chose seven for the first movement phrase (see Figure 6.9), and eight for the second movement phrase (see Figure 6.10). This shows that the combinations were somewhat challenging, and the second movement phrase for smaller muscles was slightly more challenging for participants than the first movement phrase for larger muscles.

Several participants commented on the difficulty of the upper-body exercises. Two participants specified that the push-ups, putting weight into the hands, and use of the back were the most challenging. Three participants stated that the biceps curl in the second phrase was the most difficult exercise. As discussed in Chapter Four, it may be that dancers tend to have more strength in their legs, so the lower-body exercises needed to have been either changed to more difficult movement, or to have had more repetitions in order for them to have felt the same level of intensity in their lower-body. The biceps exercise in the second movement phrase needed to have been changed to a different biceps exercise, or adjusted so that participants were able to perform it with proper form.

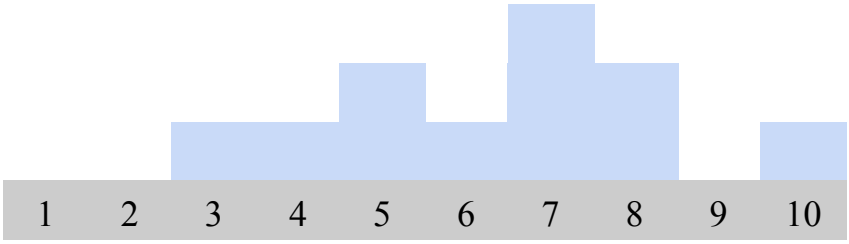

Figure 6.9 The response to Question #9 on the Workshop #1 Survey regarding the difficulty of the first movement phrase. A choice of ten on the scale represented that they felt the exercises were very challenging, and a choice of one meant they felt the exercises were not challenging.

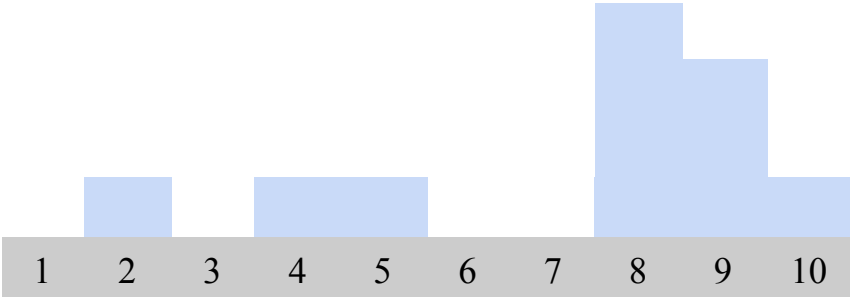

Figure 6.10 The response to Question #10 on the Workshop #1 Survey regarding the difficulty of the second movement phrase. A choice of ten on the scale represented that they felt the exercises were very challenging, and a choice of one meant they felt the exercises were not challenging.

One of the main challenges dance instructors faced was motivating their students to participate in conditioning exercise. Question eleven on the survey was aimed at discovering how motivated the participants felt during the class (see Appendix F). The majority of participants chose ten on the scale (see Figure 6.11). Ten represented the most motivated. Comments reiterated that the music was helpful toward motivation, as well as the instructor, the other participants, and the movement. One participant comment stated that they felt most motivated when they had the opportunity to fully dance the combination. Adapting the warm-up to teach some of the movement from the combinations would have allowed for the combination to be taught more quickly. This would have resulted in the opportunity for the dancers to fully dance the combinations with more repetitions.

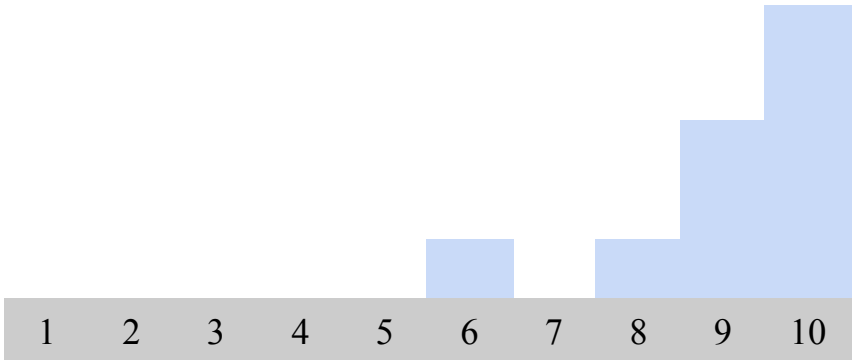

Figure 6.11 The response to Question #11 on the Workshop #1 Survey. The figure shows how motivated participants felt during the workshop. One on the scale represented that they did not feel motivated, and ten on the scale represented that they felt very motivated.

In question number twelve, participants were asked, “How well were you able to maintain your artistry while participating in the class?” (see Appendix F). The majority of participants chose eight on the scale with ten representing "very well” (see Figure 6.11). Two

participants agreed that it was easier to be artistic with the movement in the warm-up and cool-down, because it was a guided improvisation. Several participants commented that they were thinking more about learning the movement and focusing on the strengthening aspect rather than artistry. Two participants agreed that it was easier to be artistic in the first phrase, but more difficult in the second phrase. One participant explained that they did not consider the aspect of artistry. Allowing for more repetition of the full combinations would have been a way to allow for more artistry in the movement. Without the opportunity to repeat the movement phrases fully with multiple repetitions, it may have been difficult to remember the sequence of steps. This could have caused the dancers to be thinking too much about the sequence of the movement, which could have made focusing on artistry a challenge. In addition to this, since participants knew what the goal of the workshop was, it seems they were more focused on the conditioning aspect rather than thinking of it like a regular dance class. It might have been useful for the instructor to include vocal encouragement reminding the participants to practice artistry.

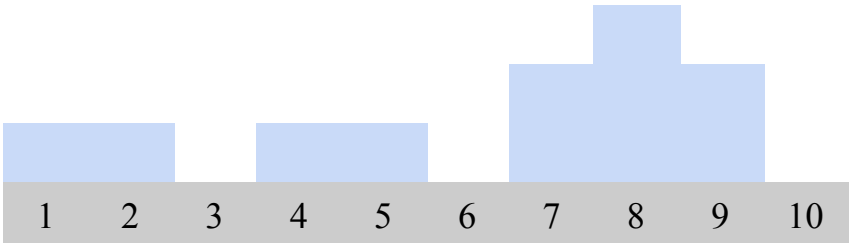

Figure 6.12 The response to Question #12 on the Workshop #1 Survey. This figure shows how well participants felt they were able to practice artistry during the movement phrases. One on the scale represented that they felt they were unable to practice artistry well, and ten on the scale meant they felt they were able to practice artistry very well.

The goal of question thirteen was to find whether or not the cool-down was effective at returning participants to a state of rest (see Appendix F). The majority of participants chose eight

and ten on the scale (see Figure 6.13). While many participants found the cool-down to be enjoyable, only a couple of participants found that it actually returned them to a resting state. Two participants felt that their breathing had returned to normal after the class ended, while three stated that they were still breathing heavily at the end of the class. One participant noted that a longer cool-down was needed. Although, the cool-down may have been somewhat effective in lowering the heart rate of the participants, the goal was to return them to a resting state. In order to do this, the increments should have been larger with longer intervals.

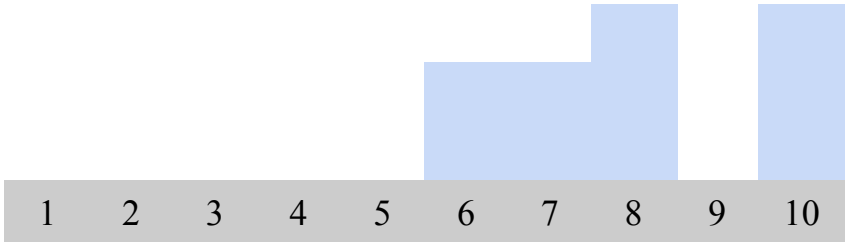

Figure 6.13 The response to Question #13 on the Workshop #1 Survey regarding the effectiveness of the cool-down. One represented "not effective," and ten represented "very effective."

Lastly, participants were asked, "How fatigued or energized did you feel at the end of class?" (see Appendix F). This question was aimed at identifying how difficult the class was overall. Two, five, eight, and nine received the same number of responses with ten being the most energized and one representing the most fatigued (see Figure 6.14). This shows that answers to the question varied greatly. The participants who had come directly from another technique class, or had a long day of dancing were unable to gauge how they felt solely on the workshop. Some participants said they felt physically fatigued, and one noted that they felt mentally energized. Two participants included that they felt accomplished. It is possible that

those that did not feel fatigued were at a higher fitness level than those that were fatigued. This means that there needed to be more opportunity for movement adaptation for those who may have been at a higher fitness level.

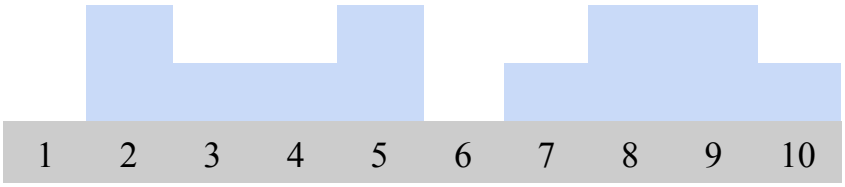

Figure 6.14 The response to Question #14 on the Workshop #1 Survey. The figure shows how energized or fatigued participants felt with one being the most fatigued, and ten being the most energized.

Based on the instructor's experience of teaching the workshop, and feedback from the survey, the first workshop was successful in the areas of class flow, musicality, motivation, and incorporation of conditioning. The continuous flow of the class from one section to the next was useful toward the goal of cardiorespiratory endurance. The music was one of the most successful aspects of the workshop in that it matched well with each section of movement, gradually progressed with the intensity level, and helped to motivate the participants. Participants also felt motivated by the instructor, other participants, and the movement itself. The incorporation of muscular strengthening and cardiorespiratory conditioning were found to be effective, and upper-body exercises were viewed as the most challenging.

There were also many adjustments that needed to be incorporated into the second workshop design. The warm-up needed to incorporate movement from the combinations in order to better prepare the participants with dance-specific movement for the dance phrases, and to aid

in expediting the teaching of the movement phrases. This relates to the concepts of using dance-specific movement and a full-body workout. The warm-up movement needed to be more dance specific relating to the dance combinations, and the participants needed to have more time to repeat the combinations on both sides for a full-body workout. Teaching the movement phrases more quickly was also something that needed to be incorporated into the second workshop in order to allow for more even repetition on both sides of the body, as well as the opportunity for participants to incorporate artistry. The active-rest exercises needed to be changed, so they could be more easily done while learning the combinations. There needed to be one active-rest movement option that could be done on the floor. This was to aid in keeping the class continuous, which was one of the main goals. By offering an active-rest movement that could have been easily done while learning the combinations, the participants would have been able to keep moving throughout the class. The music for the cool-down needed to be changed to give a more calming effect, and the beats-per-minute notes needed to be made more visible. Having a more visible notation sheet would have helped to keep the class continuous, because it would have kept the instructor from having to stop to find the next change in the tempo. The beats-per-minute for the cool-down needed to be adjusted to larger increments with longer intervals in order to achieve the goal of returning the participants to a resting state. The rate of perceived exertion scale needed be made into a visual aid. This would have allowed the participants to better gauge their energy levels and to keep with the concept of near-maximal effort. In order to ensure that participants work all muscle groups at near-maximal effort, the dance combinations needed to be adapted to incorporate more leg exercises, and include more options for progression.

Workshop Design Revisions

The workshop design was revised based on the feedback from the first workshop (see Table 6.1). Information from the instructor's experience along with survey results was combined to improve many components of the first workshop. Some of the areas of focus for design revisions included making the warm-up more specific to the dance combinations, making the combinations feel more dance-like, and altering the timing of the cool-down in order to bring participants to a resting state. The revisions are discussed in further detail in the paragraphs below.

Table 6.1 Timeline of Workshop Revisions

TIME/EXERCISE/BPM/INTENSITY OF WORKSHOP #1	INAPPROPRIATE COMPONENT	NEW COMPONENT FOR WORKSHOP #2	REASON FOR CHANGE	GOAL
Section #1 WARM-UP (1:00 - 5:00), 5 min. /Movement-Improvisation/Music-Lovely Day by Bill Withers/70 - 118 bpm/Scale 1-6 Intensity	Movement/Time	Dance specific movement from phrases (v-sits, back extension, body weight biceps curls, diamond push-ups, squats) 50 seconds of exercise, 10 seconds of active rest	Dance specific movement to better prepare for combination and aid in teaching phrases quickly/Time changed to incorporate demonstration during active rest	To mentally and physically prepare dancers for movement phrases with gradual and continuous progression of intensity using dance specific movment
(0:00 - 1:00), 1 min. /Movement-rolling, slow/Music-Lovely Day by Bill Withers/70 bpm/2 Intensity	Movement/Time	V-sits for 50 seconds, with 10 seconds of active rest	V-sits are dance specific, better preparation for combinations, aid in teaching phrases quickly/Time incorporated for demonstration during active rest	To mentally and physically prepare dancers for movement phrases with gradual and continuous progression of intensity using dance specific movment
(1:00 - 2:00), 1 min. /Movement-push/pull, weight into the hands, moving slowly/Music-Lovely Day by Bill Withers/82 bpm/3 Intensity	Movement/Time	Back extensions for 50 seconds, with 10 seconds of active rest	Back extensions are dance specific, better preparation for combinations, aid in teaching phrases quickly/Time incorporated for demonstration during active rest	To mentally and physically prepare dancers for movement phrases with gradual and continuous progression of intensity using dance specific movment
(2:00 - 3:00), 1 min. /Movement-weight into the legs, push/pull, moving slowly/Music-Lovely Day by Bill Withers/94 bpm/4 Intensity	Movement/Time	Body-weight biceps curls for 50 seconds, with 10 seconds of active rest	Body weight biceps curls are dance specific, better preparation for combinations, aid in teaching phrases quickly/Time incorporated for demonstration during active rest	To mentally and physically prepare dancers for movement phrases with gradual and continuous progression of intensity using dance specific movment
(3:00 - 4:00), 1 min. /Movement-weight into the hands, push/pull, faster/Music-Lovely Day by Bill Withers/106 bpm/5 Intensity	Movement/Time	Diamond push-ups for 50 seconds, with 10 seconds of active rest	Diamond push-ups are dance specific, better preparation for combinations, aid in teaching phrases quickly/Time incorporated for demonstration during active rest	To mentally and physically prepare dancers for movement phrases with gradual and continuous progression of intensity using dance specific movment
(4:00 - 5:00), 1 min. /Movement-weight into legs, push/pull, faster/Music-Lovely Day by Bill Withers/118 bpm/6 Intensity	Movement/Time	Squats for 50 seconds, with 10 seconds of active rest	Squats are dance specific, better preparation for combinations, aid in teaching phrases quickly/Time incorporated for demonstration during active rest	To mentally and physically prepare dancers for movement phrases with gradual and continuous progression of intensity using dance specific movment
CARDIORESPIRATORY CONDITIONING (5:00 - 25:00), 20 min./Movement-2 Phrases/Music-Shots Fired by Le Castle Vania and Wade in the Water by Eva Cassidy/118-181 bpm/7 - 10 Intensity	Movement/bpm	Added leg work, include both sides of the body, more dance related movement, timing of biceps exercise and alternate option/bpm of music during second phrase	both sides of body to evenly exercise, dance related movement to be more dance specific and increase feeling of artistry, timing of biceps and alternate option to allow proper form, bpm of second phrase to aid in proper form	Cardiorespiratory endurance training, muscular strengthening, continuous movement, dance specific movement, near maximal intensity, full body exercise
(5:00 - 15:00), 10 min. /Movement-Phrase #1 - Large muscles/Music-Shots Fired by Le Castle Vania/118-181 bpm/7-10 Intensity	Movement/bpm	Added leg work, include both sides of the body, more dance related movement	Leg work to increase difficulty of leg exercise, both sides of body to evenly exercise, dance related movement to be more dance specific and increase feeling of artistry	Cardiorespiratory endurance training, muscular strengthening, continuous movement, dance specific movement, near maximal intensity, full body exercise
(15:00 - 25:00), 10 min. /Movement-Phrase #2 - Small muscles/Music-Wade in the Water by Eva Cassidy/118-181 bpm/7-10 Intensity	Movement/bpm	More dance related movement, timing of biceps exercise and alternate option/bpm of music during second phrase stayed at 118 bpm	Dance related movement to be more dance specific and increase feeling of artistry, timing of biceps and alternate option to allow proper form, bpm of second phrase to aid in proper form	Cardiorespiratory endurance training, muscular strengthening, continuous movement, dance specific movement, near maximal intensity, full body exercise

TIME/EXERCISE/BPM/INTENSITY OF WORKSHOP #1	INAPPROPRIATE COMPONENT	NEW COMPONENT FOR WORKSHOP #2	REASON FOR CHANGE	GOAL
Section # 3 COOL-DOWN (25:00 - 30:00), 5 min. /Movement-Improvisations/Music-Zero by Yeah Yeah Yeahs/118-70 bpm/6-2 Intensity	Time/Movement/Music/bpm /Intensity	Time-larger increments of change for longer periods/Movement-dance specific movement from phrases/Music change-Pumped Up Kicks by Foster the People/106-74 bpm/Intensity from 6-1	Time was changed to aid in return to resting state/Movement was changed to be more dance specific/Music was changed for lighter mood/bpm changed to decrease at greater intervals to follow with change in time/Intensity was changed due to use of a visual modified Borg scale that began at 0 and to also follow with changes in time	Gradual decrease in intensity to return dancers to a resting state using dance specific movement and continuous activity
(25:00 - 26:00), 1 min. /Movement-weight into the legs, push/pull, moving quickly/Music-Zero by Yeah Yeah Yeahs/118 bpm/6 Intensity	Time/Movement/Music/bpm /Intensity	Time-(25:00-26:30) 1.5 min./Movement-Squats 50s, Active rest 10s, Diamond push-ups 30s/Music-Pumped Up Kicks by Foster the People/106 bpm/5 Intensity	Time was changed to aid in return to resting state/Movement was changed to be more dance specific/Music was changed for lighter mood/bpm changed to decrease at greater intervals to follow with change in time/Intensity was changed due to use of a visual modified Borg scale that began at 0 and to also follow with changes in time	Gradual decrease in intensity to return dancers to a resting state using dance specific movement and continuous activity
(26:00 - 27:00), 1 min. /Movement-weight into hands, push/pull, moving quickly/Music-Zero by Yeah Yeah Yeahs/106 bpm/5 Intensity	Time/Movement/Music/bpm /Intensity	Time-(26:30 - 28:00) 1.5 min./Movement-Diamond push-ups 20s, active rest 10s, biceps 50s, active rest 10s/Music-Pumped Up Kicks by Foster the People/90 bpm/3 Intensity	Time was changed to aid in return to resting state/Movement was changed to be more dance specific/Music was changed for lighter mood/bpm changed to decrease at greater intervals to follow with change in time/Intensity was changed due to use of a visual modified Borg scale that began at 0 and to also follow with changes in time	Gradual decrease in intensity to return dancers to a resting state using dance specific movement and continuous activity
(27:00 - 28:00), 1 min. /Movement-weight into the legs, push/pull, moving more slowly/Music-Zero by Yeah Yeah Yeahs/94 bpm/4 Intensity	Time/Movement/Music/bpm /Intensity	[Same as above] Time-(26:30 - 28:00) 1.5 min. /Movement-Diamond push-ups 20s, active rest 10s, biceps 50s, active rest 10s/Music-Pumped Up Kicks by Foster the People/90 bpm/3 Intensity	Time was changed to aid in return to resting state/Movement was changed to be more dance specific/Music was changed for lighter mood/bpm changed to decrease at greater intervals to follow with change in time/Intensity was changed due to use of a visual modified Borg scale that began at 0 and to also follow with changes in time	Gradual decrease in intensity to return dancers to a resting state using dance specific movement and continuous activity
(28:00 - 29:00), 1 min. /Movement-weight into the hands, push/pull, moving more slowly/Music-Zero by Yeah Yeah Yeahs/82 bpm/3 Intensity	Time/Movement/Music/bpm /Intensity	Time-(28:00-30:00) 2 min. /Movement-Back extension 50s, active rest 10s, v-sit 50s, active rest 50s/Music-Pumped Up Kicks by Foster the People/74 bpm/1 Intensity	Time was changed to aid in return to resting state/Movement was changed to be more dance specific/Music was changed for lighter mood/bpm changed to decrease at greater intervals to follow with change in time/Intensity was changed due to use of a visual modified Borg scale that began at 0 and to also follow with changes in time	Gradual decrease in intensity to return dancers to a resting state using dance specific movement and continuous activity
(29:00 - 30:00), 1 min. /Movement-rolling, slow/Music-Zero by Yeah Yeah Yeahs/70 bpm/2 Intensity	Time/Movement/Music/bpm /Intensity	[Same as above] Time-(28:00-30:00) 2 min. /Movement-Back extension 50s, active rest 10s, v-sit 50s, active rest 50s/Music-Pumped Up Kicks by Foster the People/74 bpm/1 Intensity	Time was changed to aid in return to resting state/Movement was changed to be more dance specific/Music was changed for lighter mood/bpm changed to decrease at greater intervals to follow with change in time/Intensity was changed due to use of a visual modified Borg scale that began at 0 and to also follow with changes in time	Gradual decrease in intensity to return dancers to a resting state using dance specific movement and continuous activity

The first component of the workshop that was changed was the active-rest exercise. One of the two options of active-rest exercises was changed to an exercise that could be done on the floor. The boxer exercise was replaced with a seated twist (see Appendix E: 6.1). This exercise was done by sitting on the floor with the knees bent, and the torso at a slight incline rotating from one side to the other. The seated twist was able to be progressed by increasing the incline of the torso, lifting and/or extending the legs, or increasing the pace of the twist. This was changed to make it easier for participants to keep moving for the goal of continuous activity.

In order to meet the goals of proper warm-up, the guided improvisation warm-up was replaced with movement from the dance combinations. The following movements were chosen for inclusion in the warm-up: v-sits, back extensions, alternating body-weight biceps curls, diamond push-ups, and squats (see Appendix E: 6.2-6.6). To better prepare dancers during the warm-up for the combinations, these exercises were chosen based on how quickly they could be taught, the significance of the movement to the dance combination, and how well they would warm-up different areas of the body. The exercises were placed in order from smaller to larger muscles, because the goal was to gradually increase the intensity and amount of energy needed to complete the exercises. These were also exercises that were able to be done in place, which made it easy to organize as the participants did not have to be told how to maneuver around the room. In order to teach each exercise, a ten-second time slot of active rest was added to each minute of the warm-up. This made it so that the participants were able to watch a demonstration of the next exercise while maintaining continuous movement. Each exercise was shortened to fifty seconds to allow for the active rest and demonstration of new movement. A side effect of changing the warm-up was that it helped to achieve the goals of near-maximal intensity, full-body workout,

and artistry during the movement combinations. This was made possible, because the dancers had already learned some of the movement during the warm-up. This took less time to teach the combinations allowing more time for repetition on both sides. More repetitions increased intensity and familiarity with the dance phrases allowing for increased artistry. Being able to repeat the choreography evenly on both sides of the body helped to achieve the goal of full-body exercise.

The first movement phrase was revised to incorporate more leg exercise, include both sides of the body more evenly throughout the phrase, and to have more of a feeling of dance movement (see Appendix E: 6.7-6.8). Extra side lunges were added to the beginning of the phrase, which changed the facing of the choreography, and moved immediately into using the other leg. There was one additional single leg squat, and additional jump lunges, added to the end of the phrase with directional changes and alternating of legs. The alternating of sides was also used in the pushing section where the dancers lowered themselves onto their stomachs, and then pushed their bodies up to their knees, or to rolled up to sitting. This pushing section was changed from the first workshop where dancers performed more traditional push-up exercises. The catching and rolling movements were more reminiscent of dance movements and were able to be progressed for greater intensity as needed. The music and intensity of the first movement phrase remained the same.

Similar to the first movement phrase, the second movement phrase was adapted to feel more dance-like in order to make the movement more dance specific and to aid in the increased ability to add artistry to the exercise (see Appendix E: 6.9-6.10). This was more difficult to achieve during the second movement phrase due to the limited options for exercising muscles of

the biceps and triceps. In order to give the phrase more of a feeling of dancing, the biceps exercise was given freedom of expression of the arm and leg on the opposite side of the body to include artistry. Dancers were encouraged to adapt the v-sit exercise to a feeling of dance by making the legs and arms more mobile. The triceps dip exercise was changed to crawl backwards and forwards instead of being done stationary to generate more of a dance feeling as well.

In order to make the body-weight biceps curl exercise easier for participants to do properly, it needed to be changed. It was difficult to find alternate exercises for the biceps muscles that did not use any equipment. The only alternate exercise found was one where the dancer sits on the floor holding one leg with a bent knee in both hands around the lower leg (see Appendix E: 6.11). The dancer then pulls the leg toward their chest and lowers it repeatedly. It was decided to give this exercise as an optional alternative to the body-weight biceps curl. Instead of changing the movement of the exercise, the timing of the exercise was changed from four counts for one repetition to eight counts for one repetition, giving the participants more time to correctly perform the body-weight biceps exercise (see Appendix E: 6.10).

Based on feedback from the first workshop, the biceps curl exercise was the most challenging of the exercises in the second movement phrase. This may have been due to a number of reasons, 1) participants may have had weak biceps muscles and 2) participants may have been inexperienced with the exercise itself causing them to feel challenged with performing the exercise correctly. In addition, the overall movement of the second phrase was also found to be difficult due to the pace of the music. In order to make the movement phrase more manageable for dancers, the beats-per-minute of the music for the second movement phrase needed to be changed to a pace less than one hundred and thirty beats-per-minute as was

previously used. It was set to the pace of one hundred and eighteen beats-per-minute (see Appendix E: 6.10), which was the lowest end of the near-maximal intensity. The rate of perceived exertion level and piece of music for this section of the workshop remained the same.

To reach the goal of bringing the dancers to a resting state, the cool-down was revised (see Appendix E: 6.11-6.15). The music, timing for intervals, and movement was changed. The music was changed to "Pumped Up Kicks" by Foster the People. The intensity of the original song choice was found to be too intense for this particular section of the class. The new song was chosen for its lighter mood. The cool-down was not able to be made longer as was needed, because it would have taken away from the minimum required cardiorespiratory exercise, which was twenty minutes. Since the workshop was only thirty minutes in length, it was decided that the cool-down would need to slow in larger increments of intensity and time. Instead of decreasing every minute of the five-minute segment, it would decrease in three segments (see Table 6.1). The music was changed in beats-per-minute for each of these segments with the goal to end near resting at seventy beats-per-minute. In the first segment, the music was lowered to one hundred and six beats-per-minute, then ninety-four beats-per-minute, and ended at seventy-four beats-per-minute. This was figured by taking the lowest beat-per-minute from the previous section of exercise, which was one hundred eighteen beats-per-minute, and subtracting the beats-per-minute goal of seventy beats-per-minute for resting heart rate. This resulted in forty-eight, divided by four for the number of times the beats-per-minute needed to be changed from the second movement phrase through the cool-down. This resulted in increments of twelve. The first increment decreased by twelve, but the following increments of ninety-four beats-per-minute and seventy-four beats-per-minute were decreased by an even larger increment of sixteen in order to

get participants closer to the resting rate of seventy beats-per-minute by the end of the workshop. The visual modified Borg scale used for the workshop began at a zero instead of a one (see Appendix J), so the exercise intensity also decreased with each of the three segments from five to three to one on the zero-to-ten scale.

The exercises for the cool-down reflected the movement used in the dance combinations by using the same structure as the warm-up in reverse order as was done in the first workshop with the guided improvisation exercises. The order of the exercises were: squats, diamond push-ups, alternating body-weight biceps curls, back extensions, and v-sits (see Appendix E: 6.11-6.15). These were also done for fifty seconds each with ten seconds of active rest in between for demonstration of the next exercise.

In order to make it easier for the instructor to give physical cues, the instructor notes were adjusted to make the beat-per-minute changes more visible (see Appendix I). Any excessive information was eliminated and bolded fonts and color were used to make the notes easier to read. Toward the goal of near-maximal intensity, the modified Borg scale was made into a visual board that was posted in the front of the dance studio during the second round of workshops (see APPENDIX J). This was used as a visual reference for participants to have a clearer understanding of energy level when referring to rate of perceived exertion.

Workshop #2

The revised workshop was given on three separate occasions during the Winter of 2018. Students from modern dance classes in levels two, three, and four participated. Twenty-eight students participated from modern two, twenty-seven students participated from modern three, and ten students participated from modern four for a total of sixty-five participants for the second

workshop. As in the first workshop, participants were given a brief explanation of the goals of the workshop, which remained the same. Participants were reminded to practice safety, and asked to notify the instructor of any injuries prior to the start of the workshop. Students were also given a brief explanation of active rest. They were told what active rest was, when to use it, and how to do the exercises. Participants were also briefed on the rate of perceived exertion scale. The reason for using the scale and how it would be referred to during the class was explained.

Instructor Findings

The seated twist exercise (see Appendix E: 6.1) worked well as an alternate option to the high-knees (see Appendix E: 6.16) exercise for the active rest. There were multiple times when the participants had finished an exercise on the floor, or were in the middle of learning an exercise on the floor, so they chose to do the seated twist. It was easier to transition into the seated twist rather than standing up to do high knees in cases when they were already on the floor. Giving an active-rest option that can be transitioned into easily from the movement given is a useful idea.

Replacing the guided improvisation warm-up with movement from the dance combinations worked better to be sure that participants were more properly prepared for the movement to come (see Appendix E: 6.2-6.6). The exercises were so closely related to the dance combinations that it gave participants exactly what they needed to prepare for the more intense portion of the workshop. It was also helpful in teaching the movement for the dance combinations, especially more difficult movements such as the alternating body-weight biceps curls and the diamond push-ups. In the first workshop most participants had difficulty learning how to do these two exercises, so using them in the warm-up gave an extra opportunity for

teaching and learning them. It was also beneficial to keep the exercises simplified to one movement, rather than combining them as they would be done in the combinations. This made them easier to teach quickly during the ten seconds of active rest in between each warm-up exercise. Overall the changes to the warm-up were successful.

Incorporating more leg exercise into the first movement phrase for the large muscles was successful at adding repetitions to increase the intensity for the leg muscles (see Appendix E: 6.7-6.8). There was also success at making the repetitions more evenly distributed to both sides of the body by alternating sides within the combination more frequently. While the combination was able to be taught at a more rapid pace, due to the use of the movement within the warm-up, the inclusion of more leg repetitions and alternating of sides made the combination much longer. In all three trials of the workshop, the participants were only able to dance the entire combination with music once on each side due to time constraints. This made it so the concept of artistry was lacking. The participants did not have enough time to repeat the combination enough times in full to feel comfortable with the movement to consider artistry. It was visible from the way participants struggled to remember the sequence of the movement that artistry was the last thing on their minds. It may have been beneficial to break the first movement phrase into two smaller phrases for large muscles.

In opposition to the first movement phrase, it was noticeable from the way the participants were able to transition more easily from one movement to the next that they had an easier time remembering the second phrase and were more able to consider artistry (see Appendix E: 6.9-6.10). This was due to the fact that the second movement phrase was shorter than the first movement phrase, and because the inclusion of the movements in the warm-up

made it easier to teach more quickly. Teaching the movements more quickly gave more opportunity for full repetitions with the music. As participants became more familiar with the sequence of the movements, they were able to add artistry.

Slowing down the timing of the alternating body-weight biceps exercise within the second movement phrase (see Appendix E: 6.9-6.10) to eight counts from four counts made the exercise easier for participants to perform properly, in addition to the fact that they were able to learn and practice it within the warm-up (see Appendix E: 6.4). The slower pace also made it easier for the instructor to go around the room and give more tactile corrections on form. Some students also took advantage of the optional biceps exercise. Participants used the alternate version if they had pain in their shoulder or elbow, or were becoming too fatigued to continue doing the alternating body-weight biceps curl (see Appendix E: 6.11). The enhanced form of the participants while performing the biceps exercise made it so the instructor was able to increase the combination tempo to one hundred and thirty beats-per-minute.

The cool-down seemed to work better to bring participants back to a resting state (see Appendix E: 6.11-6.15). The new music for the cool-down worked better than the music used in the first workshop. It coordinated better with this part of the workshop where the intensity was supposed to be decreasing. Changing the increments to three longer intervals with greater drops in intensity also helped to gradually bring participants to resting, and using the movements from the combinations were useful in teaching quickly. It was the use of the visual modified Borg scale (see Appendix J) for rate of perceived exertion that helped the most to decrease the energy of the participants. The visual RPE scale was very effective at showing participants where they should be on the scale at each point in the workshop.

The increased visibility of the instructor's notes on beats-per-minute saved the instructor time and allowed more opportunity to give physical corrections, but it was still a difficult task (see Appendix I). Paying attention to the amount of time spent on an exercise, demonstrating the next exercise, adjusting the beats-per-minute, and giving cues on proper form and intensity was a difficult number of tasks to juggle. This was something that would need to be changed for future use. A different method for music tempo in which the instructor would not have to manually change the beats-per-minute would have been more effective.

The lead researcher wore a heart rate monitor (Timex Ironman digital heart rate monitor) again during the second round of workshops to get an idea of the ability of the workshop to induce cardiorespiratory conditioning. As a reminder, the maximum heart rate of the lead researcher was determined to be one hundred and eighty-seven by subtracting two hundred and twenty from the age. In the level two modern class, the first session of Workshop #2, the researcher's heart rate went from one hundred and six beats-per-minute before the start of the class to one hundred ninety beats-per-minute half way through the class, and ended at one hundred and thirty-four beats-per-minute. In the second session of Workshop #2, held for the level three modern dance class, the researcher's heart rate began at one hundred and twenty-five beats-per-minute. Halfway through the class the heart rate went up to one hundred and sixty-three beats-per-minute, and ended at one hundred and twenty-nine beats-per-minute. In the final session of Workshop #2, held for the level four modern dance class, the researcher's starting heart rate was one hundred and thirty-eight beats-per-minute. The researcher's heart rate went up to one hundred and seventy beats-per-minute halfway through the workshop, and ended at one hundred and thirty-nine beats-per-minute. Based on these results the lead researcher's beginning

average heart rate was one hundred and twenty-three beats-per-minute. This was much higher than noted in Workshop #1, because in the first workshop the researcher took their heart rate an hour before the class began. In Workshop #2 the lead researcher took the starting heart rate just before the start of the workshop which meant that they were more active. This made the starting heart rate much higher for the second workshop. The average heart rate for the mid-point of the workshop was one hundred and seventy-four beats-per-minute, which was approximately ninety-three percent of the heart rate maximum exhibiting that near-maximal intensity was achieved during the halfway point of the workshop. This was similar to that of Workshop #1 which was one hundred seventy-nine beats-per-minute at ninety-six percent. The average heart rate of the lead researcher at the end of the workshops was one hundred and thirty-four beats-per-minute. This was close to the average starting heart rate demonstrating the cool-down was effective in lowering the heart rate, but not able to bring it down to a resting state. This ending heart rate was much higher than that of Workshop #1 which was one hundred and eight beats-per-minute. This may have been due to the change in the cool-down activities. In the first workshop the lead researcher did not have to demonstrate, rather verbally guide the participants. In the second workshop the lead researcher had to be more active in demonstrating each successive exercise. These results are similar to those of the first workshop. They show that near-maximal intensity and cardiorespiratory conditioning can be achieved within the workshop, but the cool-down was unable to return participants to full rest.

Workshop #2 Survey Revisions

The second workshop survey (see Appendix G) was revised based on responses from the first workshop survey (see Appendix F). Revisions were made with the goal to obtain clearer

feedback, and to reflect changes in the workshop. The revised survey had seven more questions than the original survey for a total of twenty-one questions. The format of the survey remained the same as the first survey with answers to questions using the one-to-ten scale, as well as space for comments.

Some questions remained the same from the first workshop survey, but many were changed to be more specific. Question number two was changed from, "How easily did the class flow from one segment to the next?" to ask, "Was the class continuous?" in order to make the question more specific and relevant to the goals of the class. Question number three was changed from, "How effective was the music used in class?" to "Was the music used during the class effective at helping to motivate you to push yourself to near-maximal effort?" This was changed to ask a more specific question about whether or not the music was motivating. Question number nine on Survey #1 became question number seven on Survey #2 and was made more specific by asking whether or not the participants felt muscular fatigue in the first movement phrase, rather than asking if the exercises were challenging. The same change was made to question number ten on Survey #1 regarding the second movement phrase. Question number thirteen on Survey #1 became question number nineteen on Survey #2. This question was changed to ask whether or not the cool-down helped to slow the participant's breathing, rather than if it brought the participant back to a resting state. This change was made, because participants were not tracking their beginning and ending heart rates, so it would not have been possible for them to actually know whether or not they had returned to a resting state. The final question on Survey #1 was the final question on Survey #2. The question was changed to ask the participants more specifically how well they felt they would be able to continue with a regular dance technique class that

included the conditioning, rather than asking them how much energy or fatigue they felt at the end of the class.

Additional questions were added to the survey for better specificity, and to expand on previous questions. Some questions were added to reflect ideas that were not in the initial survey. Because some of the original questions were removed completely, there were a total of ten new questions added to Survey #2 (see Appendix G). Questions nine and ten asked whether or not the participants felt out of breath during the first and second movement phrases. The goal of these questions was to develop an understanding of how the cardiorespiratory aspect of the workshop affected the participants. This was an extension of the previous questions seven and eight, which asked about the feeling of muscular fatigue in the combinations. This helped to separate the muscular strengthening from the cardiorespiratory training. Questions eleven and twelve were more closely related to questions nine and ten from the original survey (see Appendix F). These questions aimed at finding out whether or not the movements used in the phrases were achievable. The original survey used the term "challenging" to ask about the exercises used. The revised survey was changed to be more direct, and asked how difficult the exercises were in a specific phrase. One of the commonalities discussed earlier was the idea that the dancers should receive full-body conditioning. This was one of the four main themes used in the class design. The initial survey did not reflect this goal in any way, so Workshop #2 Survey added the question "Did you feel as if you got a full-body workout?" for question number thirteen. Question number fourteen also reflected one of the four common themes that was not in Survey #1, the idea of using dance-specific movement. To include this concept, question fourteen asked, "Were the movements used in the class dance specific?" Expanding on the idea of dance-specific

movement, question fifteen was added to ask if the movements used were useful for dance. This was to find out if there was a difference between movements that were dance related, and exercises that were useful for dance. Question eighteen was added to expand on question nineteen discussed above. Question eighteen asked, "How heavily were you breathing after the cool-down?" This was to help gauge the effectiveness of the cool-down at slowing the breathing of the participants. Question twenty was added to discover how effective the visual RPE scale was at helping participants to work at the given energy levels throughout the class. Lastly, question twenty-one was added to understand whether or not dancers felt they would be able to continue on in a regular length technique class if conditioning work, such as the work done in the workshop, was incorporated.

Workshop #2 Survey Results

As in the first workshop, at the end of the second workshop participants were asked to fill out a survey (see Appendix G). This revised survey consisted of twenty-one questions. The goals of the survey were the same as in the previous workshop; to understand the experience of the class from the dancer's perspective. Other goals included: finding out whether or not the class was successful at incorporating muscular strengthening and cardiorespiratory conditioning, whether or not it used dance-specific movement, whether or not it was continuous, whether or not the participants were able to achieve near-maximal effort, and whether or not it worked the whole body. This success was measured, in part, by how motivated, prepared, safe, and challenged the dancers felt, as well as whether or not they were able to maintain their artistry during the class. Answers were given using a one-to-ten scale with space for comments for each question.

The goal of the first question in the survey was to identify how prepared the participants felt for the movement phrases (see Appendix G). Answers ranged from three to ten with the majority choosing ten (see Figure 6.15). The majority of participants rated the warm-up as very sufficient. Most of the comments reflected that participants felt properly warmed for the work ahead. It was mentioned multiple times that the use of the movements from the dance phrases was very effective at helping the participants to warm-up. Some participants mentioned that they would have liked the warm-up to be more dance-like, and that they felt stretching was needed.

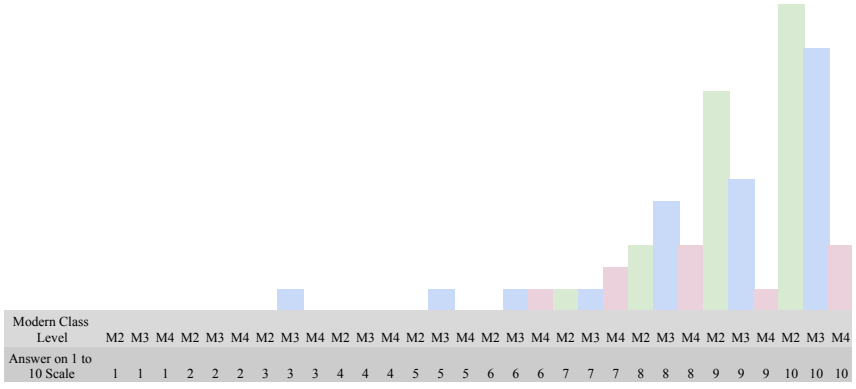

Figure 6.15 The response to Question #1 on the Workshop #2 Survey. The figure shows how sufficient the participants from each class felt the warm-up was at preparing them for the dance phrases. The choice of one on the scale represented "not sufficient," and the choice of ten represented "very sufficient."

The second question asked if the participants felt the class was continuous (see Appendix G). The aim of this question was to find if the workshop met its goal of continuous activity. The majority of participants chose ten, "very much so," as the response (see Figure 6.16). There were no comments from the level three modern class, but comments from levels one and four mostly stated that they felt the class was continuous. One participant suggested teaching the combinations prior to the start of the class to aid in continuous activity. One participant explained

that they had difficulty learning the movement while trying to maintain active rest, and another explained that they felt the active rest caused them to cool-down. This shows that sometimes the active rest wasn't an effective way to keep the class moving.

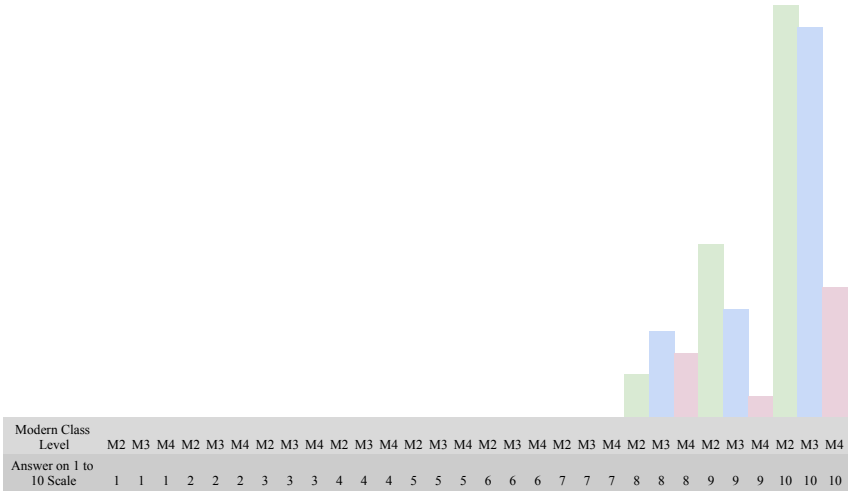

Figure 6.16 The response to Question #2 on the Workshop #2 Survey. The figure shows how continuous participants felt the class was. The choice of one on the scale reflected the choice of "not at all," and the choice of ten on the scale reflected the choice of "very much so."

The third question asked how effective the music was at motivating the participants (see Appendix G). This question was asked to find how the music choice and manipulation of beats-per-minute helped to motivate participants toward the goal of near-maximal intensity. The majority of responses from all classes combined were a ten on the scale, which meant "very effective," but the majority of responses for the level four class were a nine (see Figure 6.17). Comments received were mostly statements of enjoyment for the music, and how it was manipulated to reflect the exercise intensity. Many participants explained that they liked the music for the first movement phrase best, and found it to be the most motivating. Some explained that the slowing of the music was less effective.

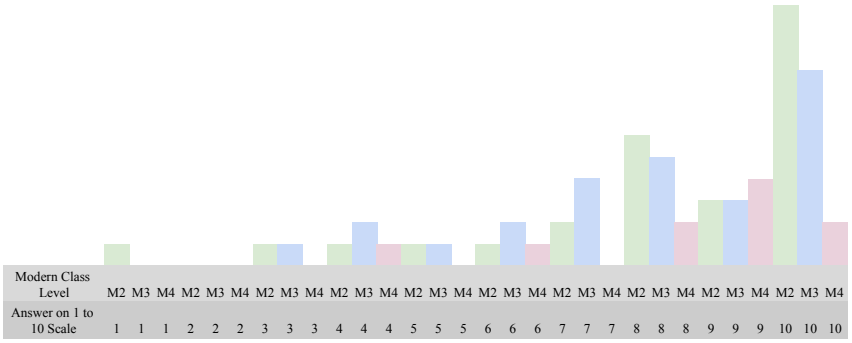

Figure 6.17 The response to Question #3 on the Workshop #2 Survey. The figure shows how motivating participants felt the music was. The choice of one on the scale reflected the answer of "not effective," and the choice of ten on the scale reflected the answer of "very effective."

Question four on the survey ranked the effectiveness of the cues given by the instructor (see Appendix G). The goal of this question was to find how well the instructor was able to cue the class while manipulating the sound and tending to all aspects of the class. This helped to identify how realistic it was for the instructor to be able to incorporate the research concepts into the technique class. Ten for "very effective" was the majority choice (see Figure 6.18). Comments countered the data stating that they felt the cues were sometimes unclear or were difficult to hear or see.

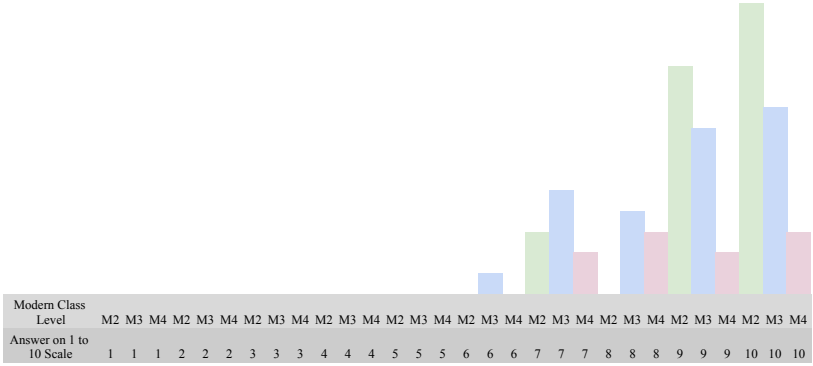

Figure 6.18 The Response to Question #4 on the Workshop #2 Survey. The figure shows how effective the participants felt the instructor's cues were. The choice of one on the scale reflected the answer of "not effective," and the choice of ten on the scale reflected the answer of "very effective."

Question five was asked to find how effective the class was at incorporating muscular strengthening (see Appendix G). This question was aimed at finding out how well muscular strengthening was able to be added into the technique class. The majority of all three trials combined chose ten, "very effective" on the scale, but the majority for the level four class chose eight (see Figure 6.19). Most comments explained that they felt the muscular strengthening was incorporated effectively. One comment from the level two class stated that they felt it was more cardiorespiratory than muscular strengthening. A couple of participants mentioned that there was some confusion on how to perform some of the exercises correctly. One participant specified that the alternating body-weight biceps curl exercise was confusing.

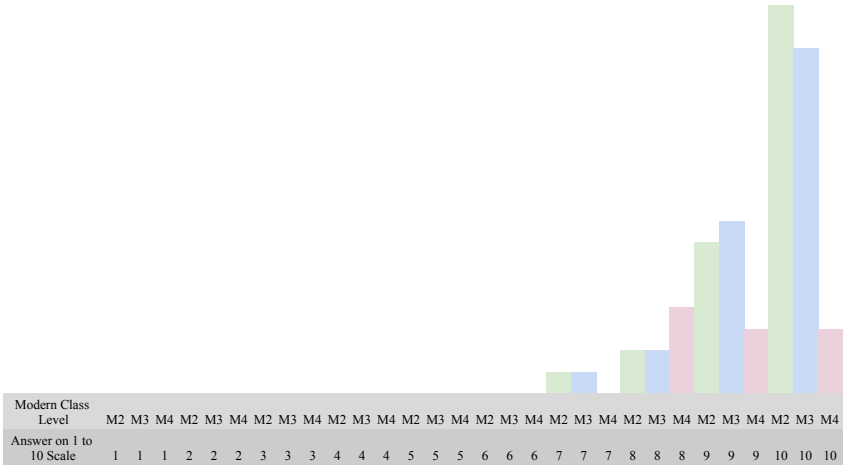

Figure 6.19 The response to Question #5 on the Workshop #2 Survey. The figure shows how effective participants felt the class was at incorporating muscular strengthening. The answer of one on the scale represented "not effective," and the answer of ten represented "very effective."

Question six asked, "How effective was the class at incorporating cardiovascular conditioning?" (see Appendix G). Similar to the previous question, this question was aimed at finding how well the main aim of incorporating cardiorespiratory training into the technique

class worked. The majority of participants chose ten as their response, which meant "very effective" (see Figure 6.20). Most of the comments mirrored this with many statements about the effectiveness of the cardiorespiratory conditioning. There were two participants that stated they thought the workshop was more focused on strength training than cardiorespiratory conditioning, and one participant felt they could have endured a longer period of time.

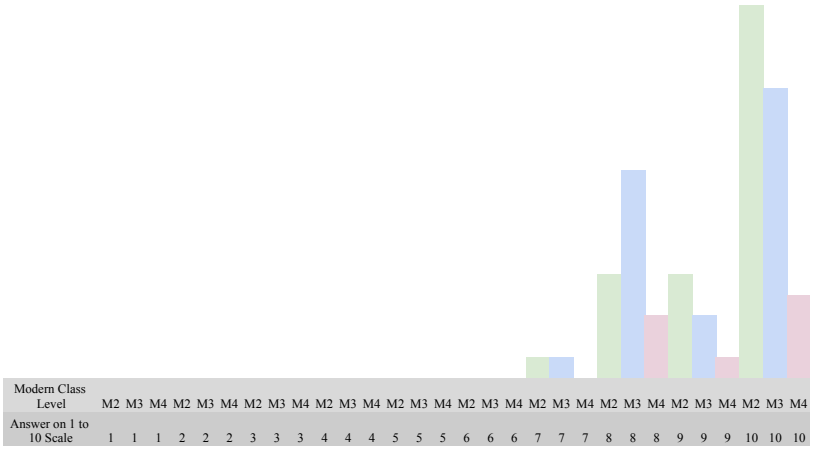

Figure 6.20 The response to Question #6 on the Workshop #2 Survey. The figure shows how effective the participants thought the class was at incorporating cardiorespiratory training. The answer of one on the scale represented "not effective," and the answer of ten represented "very effective."

Question seven on the survey asked whether or not the participants felt muscular fatigue during the first movement phrase (see Appendix G). This question was asked to decipher how challenging the movement was in the first phrase. Most chose number eight on the scale, but in the level two and four classes five was the majority vote (see Figure 6.21). The comments explained that muscular fatigue was felt somewhat, but there were a couple of participants that stated they felt they could have pushed themselves harder in order to have caused more muscular fatigue.

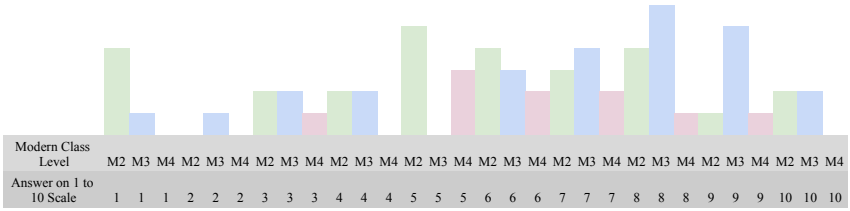

Figure 6.21 The response to Question #7 on the Workshop #2 Survey. The figure shows whether or not participants felt muscular fatigue in the first movement phrase. The answer of one on the scale represented "not at all," and the answer of ten represented "very much so."

Similar to question seven, question eight was asked to find how difficult the movement in the second phrase was (see Appendix G). This was asked in order to identify if the movement design was able to properly challenge the participants toward the goal of near-maximal effort. Nine on the scale of one-to-ten was the most chosen response (see Figure 6.22). Fourteen participants chose nine, which means that they felt muscular fatigue fairly strongly in the second phrase of movement. The level two class mostly chose eight. Most comments reflected this. A couple of participants, one from the level two class and one from the level four class, stated they did not feel any muscular fatigue in the second dance combination.

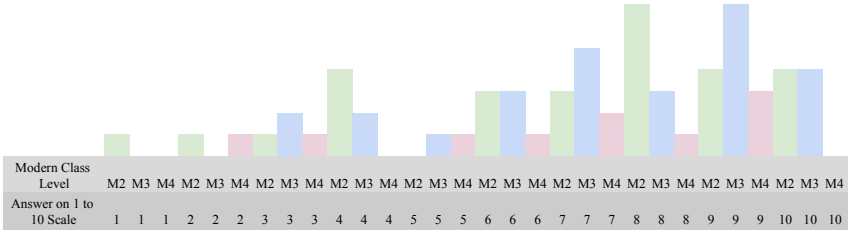

Figure 6.22 The response to Question #8 on the Workshop #2 Survey. The figure shows whether or not participants felt muscular fatigue during the second movement phrase. One on the scale represented "not at all," and ten on the scale represented "very much so."

Question nine asked how out of breath participants felt during the first movement phrase (see Appendix G). This question was asked regarding the cardiorespiratory aspect of the first movement phrase to find how challenging the movements in the first phrase were. This was done in order to know whether it was effective at cardiorespiratory conditioning or not. Seven was the answer that was chosen the most, which meant that participants felt somewhat out of breath in the first movement phrase (see Figure 6.23). Only a couple of comments reflected this. There were a couple of comments that stated the participants felt no change in their breathing, but they felt otherwise tired. One participant from the level three class explained that they felt out of breath specifically in the beginning of the phrase. Another participant from the level four class explained that they were not pushing themselves hard enough to feel out of breath due to the feeling that they were not warm enough.

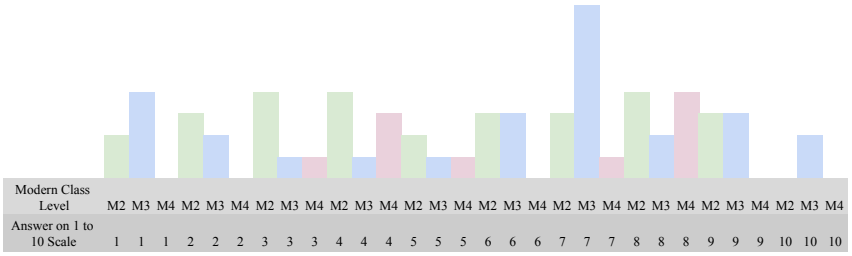

Figure 6.23 The response to Question #9 on the Workshop #2 Survey. The figure shows how out of breath participants felt during the first movement phrase. One on the scale represented "not at all," and ten represented "very much so."

Question number ten was also aimed at finding how effective the movement was at cardiorespiratory conditioning (see Appendix G). This was focused specifically on the second phrase of movement. There was a tie between choices five and six on the scale (see Figure 6.24). This means that participants felt less out of breath during the second movement phrase than in

the first. The level two class tied between choices five, eight, and nine. The level three class mostly chose seven, and the level four class mostly chose six. Few comments were given. The level three class gave no comments, but the same participant from the previous question reiterated that they were not pushing themselves hard enough due to feeling that they were not warm. Others repeated as before that they felt no change in breath, but still felt tired, and one comment stated that the participant felt "pushed."

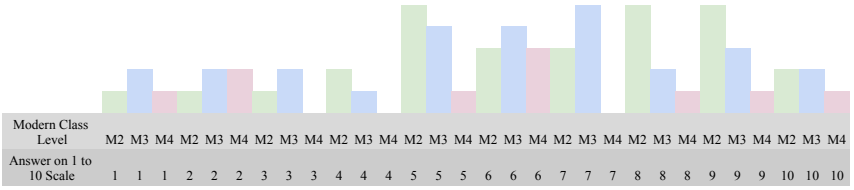

Figure 6.24 The response to Question #10 on the Workshop #2 Survey. The figure shows whether or not participants felt out of breath during the second movement phrase. One on the scale represented "not at all," and ten on the scale represented "very much so."

Questions eleven and twelve asked how difficult the exercises were in phrases one and two (see Appendix G). This was asked in order to find whether or not the movement design was challenging enough to push the participants to near-maximal intensity. The majority of participants chose seven as their response for the difficulty of both phrase one and two (see Figures 6.25 and 6.26). Seven reflects that most participants felt that the movements where somewhat difficult. Many participant comments explained that the movements themselves were not complex, but the difficulty was in the strength needed to perform the movements. Some also felt that the difficulty was in being able to remember the choreography, and learn it quickly. One participant specified that the diamond push-ups and inversions were difficult. Many participants

felt that the triceps and biceps exercises were the most difficult. Two participants from the level two class stated that they thought the second phrase was more difficult than the first. One of them specified that this may have been due to the continuous activity throughout the class.

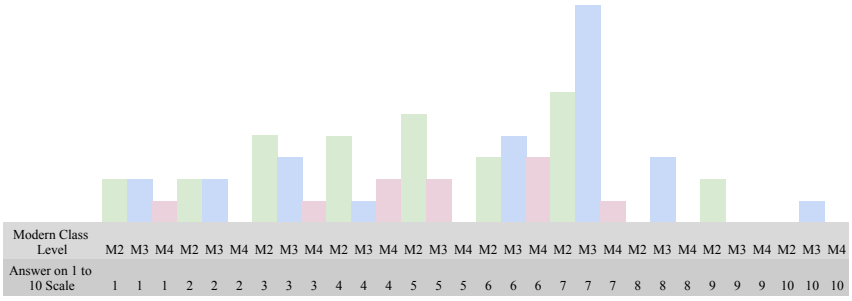

Figure 6.25 The response to Question #11 on the Workshop #2 Survey. The figure shows how difficult participants felt the movements were in the first phrase. One on the scale represented "easy," and ten represented "very difficult."

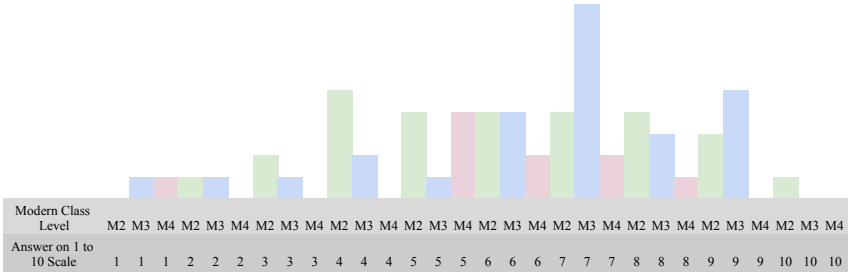

Figure 6.26 The response to Question #12 on the Workshop #2 Survey. The figure shows how difficult participants felt the exercises were in the second movement phrase. One on the scale represented "easy," and ten on the scale represented "very difficult."

The thirteenth question asked whether or not participants felt they had a full-body workout (see Appendix G). This question was asked to find if the workshop met the goal of exercising the entire body. The majority of participants from all three classes combined chose ten on the scale (see Figure 6.27). This meant that the majority of students chose the answer, "very much so." Separately, the majority of the level three and four classes did not choose a ten on the

scale. The level three class chose eight, and the level four class chose nine. Ultimately, all classes felt there was close to, or definitely, a full-body workout. Comments reflected this, but as in the first workshop some participants felt there could have been more exercise for the legs. Participants stated that the gluteal muscles, hamstrings, and feet were parts of the lower-body that could have been given more attention.

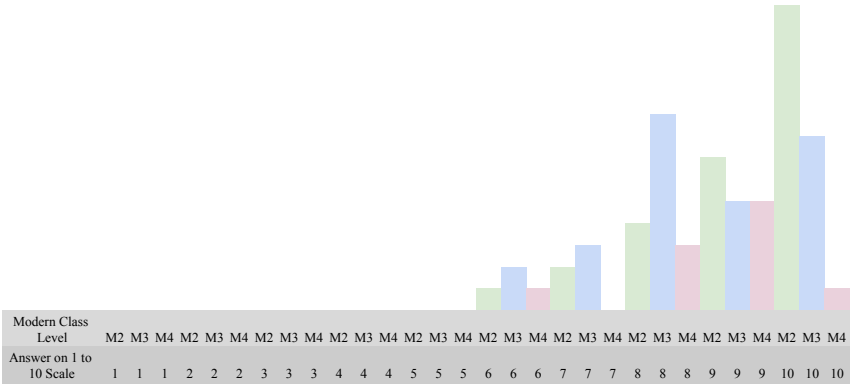

Figure 6.27 The response to Question #13 on the Workshop #2 Survey. The figure shows whether or not participants felt that they had a full-body workout. One on the scale represented "not at all," and ten on the scale represented "very much so."

Question fourteen was asked to identify whether or not the movements used were dance-like to find if the workshop met the goal of using dance-specific movement (see Appendix G). The majority of responses were ten on the scale for "very much so" (see Figure 6.28). The majority of the level three class chose eight, and the majority of the level four class chose nine, meaning that they felt the movement was mostly dance specific. Most comments reiterated this, but one participant mentioned that they felt there were some moments when the movement was not dance specific. One participant thought the movements could have been further developed into a dance phrase.

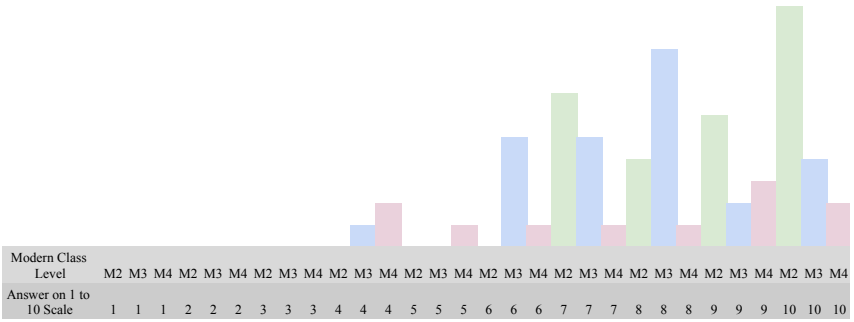

Figure 6.28 The response to Question #14 on the Workshop #2 Survey. The figure shows whether or not participants felt the movements used were dance specific. One on the scale represented "not at all," and ten represented "very much so."

Question fifteen asked if the participants felt the movements were useful for dance (see Appendix G). This question was aimed at discovering if the movements used, whether or not dance-like, were still found to be useful for dance. The majority of participants from all three classes combined chose a ten on the scale (see Figure 6.29). Number ten on the scale meant that they felt strongly that the movement used in the class was very useful for dance. The level three modern class majority chose eight, meaning that they thought the movements used were mostly useful for dance, and the level four class tied between ten and seven on the scale. The comments were mostly a reflection of this.

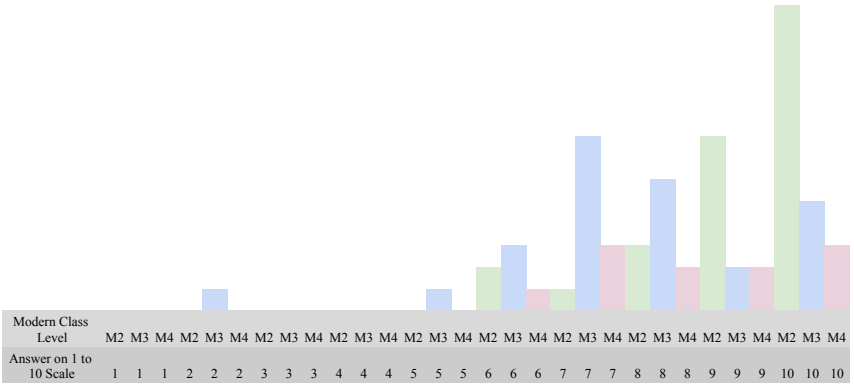

Figure 6.29 The response to Question #15 on the Workshop #2 Survey. The figure shows whether or not participants felt the movements used in the class were useful for dance. One on the scale represented "not at all," and ten represented "very much so."

Question sixteen asked participants how motivated they felt during the class (see Appendix G). This question was related to the challenge that professionals faced when trying to incorporate conditioning into their technique classes. The question was asked to find if the workshop was able to overcome this challenge. The majority of the participants chose eight on the one-to-ten scale (see Figure 6.30). In the level two class the students felt very motivated as the majority chose the answer ten. The level three class was the same as the majority of all classes combined, and the level four class was tied between seven, eight, and nine. Most of the comments came from the level two class. The level three class did not make any comments. The comments received mostly explained that the students felt motivated by the music and the instructor. A couple of comments stated that they felt they needed to motivate themselves further.

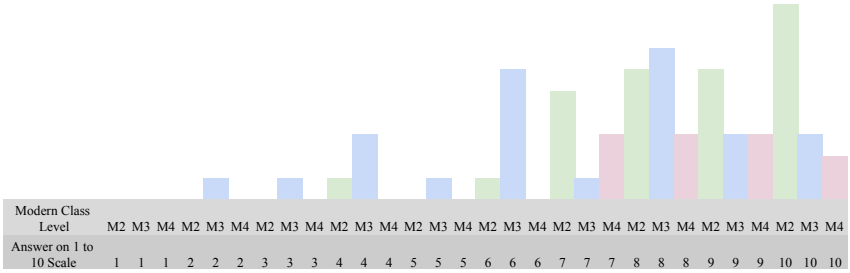

Figure 6.30 The response to Question #16 on the Workshop #2 Survey. The figure shows how motivated participants felt during the class. One on the scale represented "not motivated," and ten represented "very motivated."

The seventeenth question on the survey asked participants how well they were able to maintain their artistry during the class (see Appendix G). This question was asked to find how well the movement was designed to make the exercises feel like dancing. Most participants chose six on the scale meaning that they were able to incorporate artistry slightly (see Figure 6.31). Six was the most chosen response for the level two and three classes. Level four was tied between five and six on the scale. Most comments explained that it was difficult to incorporate artistry, or that they were not thinking about artistry at all. Some dancers considered the class to be strictly conditioning, and did not think of it as a dance class. A couple of participants stated that the ability to incorporate artistry was dependent on how difficult the movement phrase was. Two participants from the level four class explained that they enjoyed the movement.

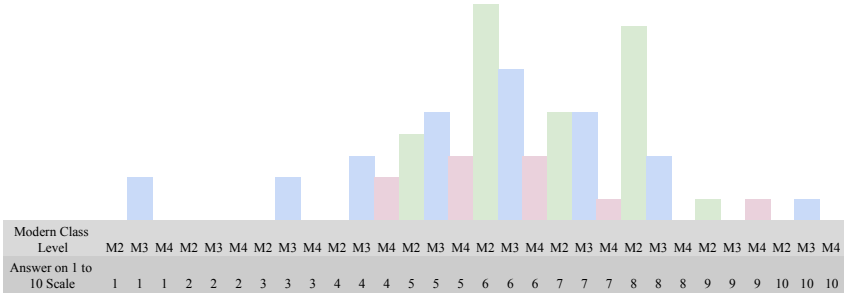

Figure 6.31 The response to Question #17 on the Workshop #2 Survey. The figure shows how well participants felt they were able to maintain their artistry during the class. One on the scale represented "not well," and ten represented "very well."

Question eighteen, regarding the effectiveness of the cool-down, asked how heavily participants were breathing at the end of the cool-down (see Appendix G). This was asked to determine whether or not the participant's breathing was returned to a resting state as was the goal. The majority of responses were tied between a six and an eight on the scale of one-to-ten (see Figure 6.32). Ten on the scale meant "very heavy," and one meant "regular resting breath." This shows that most dancers felt they were breathing somewhat heavily. However, participants that commented on this question stated that they felt the cool-down was effective at returning them to their normal breathing. This response related to question nineteen, which asked whether or not the cool-down was able to slow the breathing of the participants (see Appendix G). The goal of this question was to find if the cool-down was able to begin to return participants to the goal of resting, even if a resting state was not achieved. Most participants chose eight as their response with ten being "very effective" (see Figure 6.33). This shows that participants felt the cool-down was mostly effective at helping to slow breathing. Comments for this question were a variety. Some participants stated that they felt the last exercise for the cool-down, the v-sit (see Appendix E: 6.15), was more difficult than the first exercise, the squat (see Appendix E: 6.12).

Even with guidance toward gradual decrease of intensity, a couple of participants felt the diamond push-ups were too difficult to be done as part of the cool-down (see Appendix E: 6.13). Other participants stated that they felt they should have changed their energy output more dramatically during the cool-down.

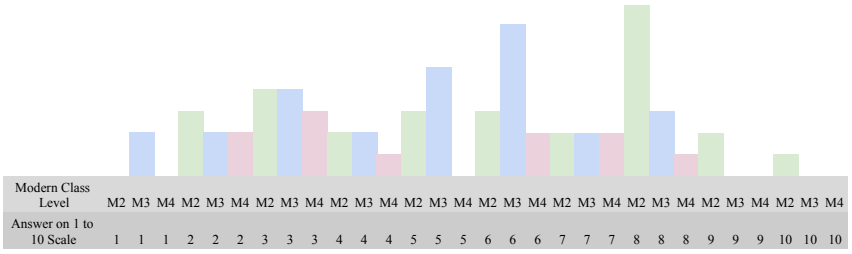

Figure 6.32 The response to Question #18 on the Workshop #2 Survey. The figure shows how heavily participants felt they were breathing after the cool-down. One on the scale represented "regular resting breath," and ten represented "very heavy."

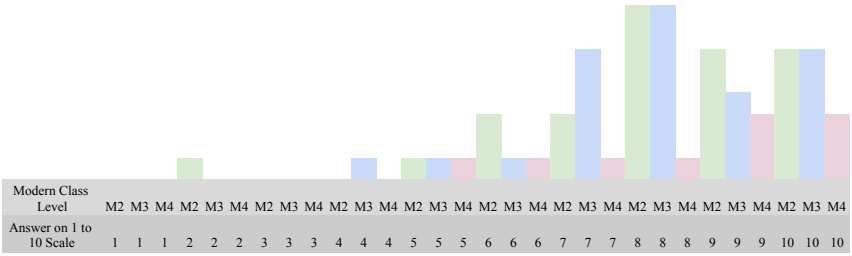

Figure 6.33 The response to Question #19 on the Workshop #2 Survey. The figure shows how effective participants felt the cool-down was at slowing their breathing. One on the scale represented "not effective," and ten represented "very effective."

Question twenty (see Appendix G) asked how effective the rate of perceived exertion scale was at helping participants to gauge their energy levels. The goal of this was to identify how useful the visual modified Borg scale (see Appendix J) was at getting participants to work at near-maximal effort, which was one of the four main concepts for the workshop. Most participants chose eight as their answer (see Figure 6.34). The level two class response was a tie

between eight and nine, and the level three class mostly chose seven. The level four class tied between a five, seven, eight, and ten. Only a few participants commented on this question. Three participants stated that they felt the scale was helpful. One participant said it was hard to remember to use the scale, and another said they had difficulty gauging their energy level.

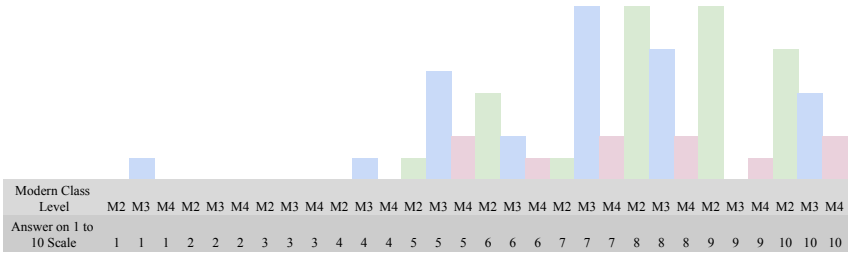

Figure 6.34 The response to Question #20 on the Workshop #2 Survey. The figure shows how effective participants felt the rate of perceived exertion scale was at helping them to gauge their energy level. One on the scale represented "not effective," and ten represented "very effective."

The final question, number twenty-one, asked, "How well do you think you would be able to perform regular dance technique exercises if this workshop was incorporated into a regular length dance technique class?" (see Appendix G). This question was aimed at finding out whether or not the concepts of the workshop were feasible for incorporating into a regular length dance technique class. This feasibility would determine whether or not conditioning within dance technique classes is achievable overall. The majority of responses were a ten on the scale, meaning "very well" (see Figure 6.35). The majority of the comments for this question were statements claiming that this type of conditioning work is needed, and would be beneficial to their dance training. Some participants were in disagreement with this stating that the class would need to be longer. They explained that it would be difficult to implement, and that they would be too tired to continue working on dance technique. One participant thought that the

movements should be less dance specific, so that students could use the class as an opportunity to learn exercises they could take to the gym.

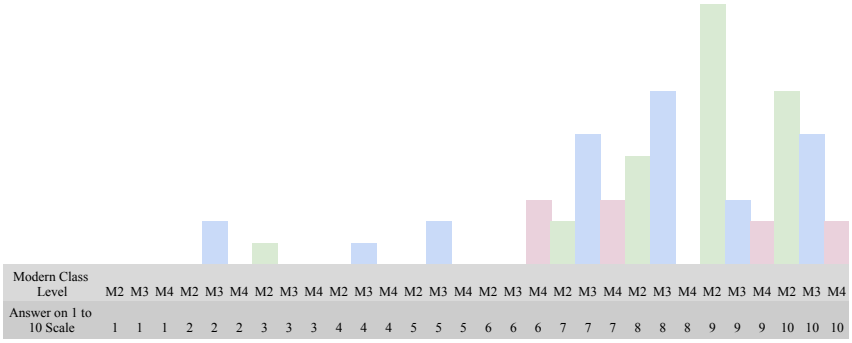

Figure 6.35 The response to Question #21 on the Workshop #2 Survey. The figure shows how well participants felt they would be able to perform regular technique exercises if the workshop were incorporated into a regular length technique class. One on the scale represented "not well," and ten represented "very well."

The survey results showed that participants felt the workshop achieved its goal of effectively incorporating muscular strengthening, and cardiorespiratory conditioning into a collegiate level modern dance technique class. In terms of the four commonalities, the survey results showed success in making the class a continuous, full-body workout that was dance specific, but was lacking in the area of near-maximal effort. Participants chose an eight on the one-to-ten scale stating that the RPE scale was only somewhat effective. Some comments explained that there was some difficulty gauging their energy level, or remembering to use the scale throughout the class. The results showed that the workshop was successful at including the following: proper warm-up, motivating music, and clear instruction. Most participants felt that if this type of conditioning work was included in their technique classes, they would be able to continue with the technique work, and be able to do it more successfully over a period of time. Many included in their statements that they felt it was a necessity.

The survey results showed that the movement in the dance combinations was somewhat challenging. This is good, because it aids in properly fatiguing the muscles for the adaptation of strength, but it was not too difficult to correctly perform the exercises. The results also showed that participants felt some muscular fatigue during the dance combinations. They felt slightly more muscular fatigue in the second combination than in the first combination. This may have been due to the fact that the smaller muscle groups are weaker in dancers, or that the second combination taking place after the large muscles felt more difficult due to the continuous activity. Results showed that participants were somewhat out of breath in the first movement phrase, and more out of breath in the first movement phrase than in the second. This means that the first movement phrase was more challenging in cardiorespiratory training than the second movement phrase. The muscular fatigue and slightly heavy breathing showed that participants were working at close to maximal intensity, but not to the point of complete exhaustion. This means that students would be able to do work such as this within a dance technique class, as mentioned above, and still have energy to participate in further technique work during a regular length technique class.

In contrast, there were some areas that needed further improvement. The survey results showed that participants only felt somewhat motivated during the class, and were only somewhat able to maintain artistry. While these two areas were not entirely unsuccessful, they could use further improvement in order to gain better results toward the goals of near-maximal effort and dance-specific movement. The cool-down was successful at slowing the breathing of participants, but not fully successful at bringing the dancers to a resting state. In a regular length dance class a longer period of time for cool-down may be the solution to this problem. While the

main goals of the workshop were achieved, some of these details could be improved for even better results.

CHAPTER SEVEN

Discussion

This research study explored how to incorporate muscular strengthening and cardiorespiratory conditioning into a modern dance technique class at the college level. The study investigated factors such as specific exercises, intensity, duration, and ultimately whether or not incorporating conditioning within the technique class is feasible. The methodology included a literature review, interviews, and workshops. Literature included dance science research with an emphasis on supplemental training for dancers. Interviews were conducted with modern dance instructors who have taught at the college level, and supplemental training practitioners that have worked with dancers. Information from literature and interviews were combined (see Appendix D) to create a class design (see Table 5.1), which was tested in a thirty-minute workshop for dance majors. Using feedback from participant surveys (see Figures 6.1-6.14), the class was revised and tested a second time (see Table 6.1). Results from the second workshop were compiled to conclude the study (see Figures 6.15-6.35).

Findings from the study found that it is possible to incorporate muscular strengthening and cardiorespiratory conditioning into a modern dance technique class at the college level. Four common themes of continuous movement, dance-specific movement, full-body exercise, and near-maximal intensity were discovered as important components to successful conditioning within a dance technique class. These four themes encompassed further commonalities such as: one-to-one work-to-rest ratio, gradual increase and decrease of intensity, large muscles before small muscles, aerobic movement before anaerobic movement, variations and options for

students, active rest, twenty-minute minimum cardiorespiratory training, Pilates Method, Yoga-style exercise, plyometric exercise, and sixteen repetitions of push-ups or two minutes of arm exercises.

The successful incorporation of muscular strengthening and cardiorespiratory conditioning into a thirty-minute modern dance workshop is important, because it shows that it can be done in a limited amount of time. A typical dance technique class is between one to two hours in length. Criticism of incorporating conditioning into the dance class often states that there is not enough time to include conditioning while still prioritizing the technical focus of the class. If conditioning can be included in only thirty minutes, this leaves thirty minutes to an hour and a half to focus on technique. Furthermore, the success of making the workshop movement dance specific additionally alleviates the problem of conditioning exercise taking away from technical training as it overlaps as dance training. Technical training for dance can double as conditioning work as long as factors such as intensity, duration, and muscle group are taken into account. Additionally, the use of dance-specific movement as conditioning exercise can be included throughout the class. This workshop was designed to focus on using dance-specific exercise to condition dancers, but a dance technique class would not necessarily need to leave a thirty-minute window of time set aside specifically for conditioning. This would allow the technique class to flow in a way that is more suitable for the instructor's class design, again, as long as attention is paid to factors mentioned above.

The discovery of the four main themes and their encompassed commonalities from literature and interviews is another important finding, because they aid in building a framework. As presented in Chapter Four, many professionals have already begun to include conditioning

work into their dance technique classes. There may be instructors who wish to incorporate conditioning but are unsure how to do it and/or what to include. Having a framework to follow may be useful for those already adding conditioning to dance classes, as well as for those who wish to begin. The commonalities help to develop a guide for what is important to include and can aid instructors in the practical application of adding muscular strengthening and cardiorespiratory conditioning to dance technique classes.

In my own investigation with incorporating these themes into a workshop, I discovered that the goal of near-maximal intensity was one of the most difficult to achieve as it was difficult to monitor. It was dependent on the participant's individual fitness level and subjective interpretation of their own efforts. Using the visual RPE scale was more successful than purely verbal instruction, but not as successful as some of the other aspects of the class. I believe that with more practice and discussion of the scale during a quarter or semester long course students would begin to better understand the scale and would be better able to gauge their own energy levels.

The goal of continuous activity was achieved through use of active rest. Using movements that can be easily transitioned to from the work that is being done is important. The choice of the seated twist exercise (see Appendix E: 6.1) for active rest was more successful than the boxer exercise used in the first workshop (see Appendix E: 5.1), because it was easier to transition into from floor work. The other factor to consider in active-rest exercise is that it needs to be movement that can be both simplified or made more complex. This is important in order to maintain the proper intensity, which may be different for individuals based on their fitness level.

As described in Chapter Five, dance-specific movement can be interpreted in two ways. It can be an exercise that is useful for dance or relates to a specific musculature used in a specific dance movement, or is closely related to codified dance steps. It also can be interpreted as dance movements used as exercises, or exercises made to look like dance movements. I used both interpretations of dance-specific movement in my class design. In the first workshop the warm-up and cool-down were more like dance movement used as exercise (see Appendix E: 5.2-5.6, 5.11-5.15), and the combinations were more like exercises that were useful for dance (see Appendix E: 5.7-5.10). In the second workshop these interpretations were reversed. for the warm-up and cool-down (see Appendix E: 6.2-6.6, 6.11-6.15) I used exercises that were useful for specific dance movements. They were movements that focused on the musculature used, and were closely related to the dance movements themselves. The combinations used dance movements as well as exercises made to look like dance movements (see Appendix E: 6.7-6.10). Whatever the chosen interpretation, the important factor is that the exercise is useful for dancers in preparation for the movements they will be performing on stage.

The successful incorporation of exercises for all areas of the body was a challenge to create. I was limited to creating dance exercise combinations that used only an individual's body and the studio floor. When designing my workshop I knew that I would not have access to exercise equipment such as bands or weights. I also did not know what dance studio I would be using, and how many participants I would have, so I decided not to include the use of the ballet barres. I did this because if I had too many students for the number of barres in the space the exercises would not be able to be done properly, and I also did not know if the studio I was using would even have barres in it. Another reason the class design was limited to using only the body

and floor was because it is common in dance classes that there is not access to exercise equipment. This made my class design more versatile and useful to a greater number of instructors who may not have time or access to equipment. I considered including partner exercises where resistance could be added using another person, but decided against this for the sake of time. I felt it might take too long to explain a partnered exercise over something individual. Partner work, or use of the studio walls and barres, or other equipment could be useful toward increasing the number of ways exercise can be incorporated into a dance class. Designing exercise movement for the biceps and latissimus dorsi muscles was the most difficult to do without equipment, and limited me to only one or two options of movement for these muscles. When designing a class such as this, instructors should take into account their time and access to equipment. The movement needs to be analyzed in order to be sure that all muscle groups are being activated.

The warm-up was found to be more successful in the second workshop over the first workshop due to the revision of the movement design. The guided improvisation warm-up used in the first workshop (see Appendix E: 5.2-5.6) was ineffective because the participants were not aware of what they were preparing themselves to do. While the improvisation was directed, the interpretation of the directions differed by individual making some dancers under prepared for the movement. Some participants recommended either demonstrating or telling the dancers what to expect prior to the improvised warm-up, so they would have a better understanding of how to use the guided improvisation for preparation. This may have been effective, and could be used in another scenario. In a quarter or semester long course students may begin to understand how they need to use the guided improvisation as a preparation based on previous classes. In this case, I

decided to steer away from the guided improvisation completely in the second workshop in order to be sure that the warm-up was specific to the movement combinations, and to aid in teaching the movement more quickly. I found this to be a very successful way to ensure proper warm-up (see Appendix E: 6.2-6.6). While the time limitation made teaching the movement difficult, using the warm-up as a place to begin to familiarize students with the movement was helpful and made teaching the movement more successful in the second workshop.

In order to gain enough participation in the workshops, the time was limited to thirty minutes. This restricted the amount of time that could be spent teaching phrase work for the workshop. It also limited the option to attempt to place the conditioning within a normal length dance technique class, and made it so the cool-down was not long enough to achieve a resting state. Some of the participants found it difficult to learn the dance combinations due to how quickly they were taught. Similar to the feedback mentioned previously, one participant recommended that the dance phrases be taught before the start of class. I chose not to teach the movement in advance of the class, because I wanted to be sure to stay within the thirty-minute timeframe to get an idea of what it would be like in an actual dance class where the instructor has to teach the movement during the class time. It was very difficult to teach quickly, and I did not always achieve the opportunity for the dancers to fully dance the phrase work multiple times, but I think in a normal quarter or semester long course the students would be able to know the phrases within just a few classes. This would then allow them to spend less time learning the movement, and more time performing it. Being able to perform the movement would also enable them to begin to feel comfortable enough with the movement to incorporate artistry.

Many students stated that it was difficult to incorporate artistry due to the limited amount of time to learn the movement. Others also felt that artistry was something they did not consider, because they thought of the workshop as a conditioning class. Due to the limited class time, I was not able to place the conditioning activities within a regular length dance technique class. If I had been able to do this I would have incorporated modern dance technique exercises such as pliés and leg swings. This would have given a better idea of how the conditioning fit among other technical work. I think students would have perceived the workshop as more of a dance class and less of a conditioning course if this were done. Thinking of the class as a dance class may have made them consider the concept of artistry more strongly.

The dance combinations were adjusted for the second workshop to alternate between both sides of the body more evenly within the combinations (see Appendix E: 6.7-6.8). This was done in opposition to the first workshop where everything happened on one side of the body in the combination and had to be completely reversed in order to gain repetitions on the opposite side of the body (see Appendix E: 5.7-5.8). The combinations were also adapted for the second workshop to feel more dance-like to aid in the sense of artistry. The increased alternating of sides within the combination was successful at creating even repetitions for the body, but the artistry was still an area of difficulty. The development of artistry seemed to rely more heavily on the familiarity of the movement, which would be better achieved in a regular length class with more time for the movement, or a course which can be taught over a quarter or semester long period.

In the first workshop, it was found that participants felt there was more exercise for the upper-body than for the lower-body. Due to this, I decided to increase the amount of work for the lower-body in the second workshop (see Appendix E: 6.7-6.8). As discussed in Chapter Six,

dancers may be stronger in their lower-body, which means they need additional lower-body exercise in order to achieve the same level of fatigue as in their upper-body. This would also explain why some participants in the second workshop stated that they felt the movements used for the beginning of the warm-up, end of the cool-down, and in the second movement phrase were harder than at the end of the warm-up, beginning of the cool-down, or in the first movement phrase. The movements they felt were more difficult were the movements of the upper-body and core. The movements they felt were easier were the exercises that used the legs. It is important when working with a group toward the goal of muscular strengthening to assess their level of fatigue, or feeling of muscle burn, in order to know whether or not the chosen exercise is effective. This is also a place where progression and regression may be needed, and where the use of the RPE scale to increase intensity can aid in attaining the proper feeling for the participants.

Dancers also felt that the second movement phrase (see Appendix E: 6.9-6.10) was less cardiorespiratory than the first movement phrase (see Appendix E: 6.7-6.8). This is likely due to the fact that the second movement phrase was done solely on the floor. Again, communicating with students to understand their level of muscular or cardiorespiratory fatigue will aid the instructor in knowing whether to progress or regress an exercise, and/or to guide students with the RPE scale in order to achieve the correct intensity level for adaptation. This exercise could also have been adjusted to incorporate more level change, which may have aided in increased cardiorespiratory fatigue.

The five-minute length of the cool-down was not long enough to return participants to a resting state. Due to the limited time of the workshop, the cool-down could not be lengthened as

was needed. In order to include the minimum five-minute requirement of warm-up and cool-down in addition to the minimum twenty-minute requirement of cardiorespiratory training, the cool-down time could not be adjusted. Instead, the intervals for regression in the cool-down were made greater with a longer amount of time spent at each interval (see Table 6.1). In the first workshop there were five one-minute intervals (see Table 5.1). In the second workshop there were three intervals, two intervals of one and a half-minutes, and one interval of two-minutes. The intensity levels for each interval in the second workshop dropped further than in the first workshop. This improved the ability to slow the breathing, but was still unable to return participants to a complete state of rest. I believe the cool-down would need to be extended to between eight and ten minutes to achieve the resting state. This additional three to five minutes would not take much more time away from technique in a regular length dance class, and could be done through continuing to practice dance-specific movements while gradually decreasing the intensity.

The music used in the workshop was found to be effective toward motivating participants to push themselves to near-maximal effort. Based on feedback the motivation of the music was mostly related to the way the music was manipulated to reflect the target beats-per-minute of the participants. Some participants explained that they enjoyed the style or specific pieces of music chosen, but most responded about the changing pace of the music in relationship to the cues for intensity that were given. The pieces of music used for each section of the workshop were chosen based on my personal digital music library, the mood of the piece of music, and whether or not the Tempo Magic application would allow the use of the song based on licensing. These factors limited the options. Most comments received about the specific music chosen stated that they

enjoyed the piece of music used for the first movement phrase the most. This may have been due to the style and intensity of that particular selection in relationship to the difficulty of the exercise. As an instructor, I found it difficult to manipulate the tempo of the music while managing the time allotted for each exercise, tempo change, and continuing to cue the participants. While participants stated that the instructor cues were "Very Effective," it was very challenging from an instructor's perspective. The Tempo Magic application itself is easy to use, but trying to balance these multiple tasks was very difficult. Streamlining my instructor notes (see Appendix I) made the second workshop slightly more successful than the first workshop at managing the tasks, but overall it remained difficult. Over time an instructor may be able to memorize the target beats-per-minute, and become more adept at handling it all. There may also be other music applications for tempo change available with the ability to automate the changes. This would make the aspect of managing tasks easier for the instructor.

Overall motivation during the class was ranked at an eight on the one-to-ten scale with ten being the most motivated. This shows that participants felt mostly motivated. Through instructor cues, the music style, and manipulation of the music the workshop was able to overcome the challenge of motivation that was expressed by interviewed instructors. Comments from participants who did not feel motivated explained that the lack of motivation was felt mostly during the moments when the music was slowed. Others felt it was due to their own personal lack of self motivation. To further improve motivation in participants one might try eliminating the very slow music tempos for the warm-up and cool-down. Using music at its recorded tempo for warm-up and cool-down may still be effective while referring to the RPE scale for intensity level. Music tempos could be adjusted for beat-per-minute targets during the

main portion of the conditioning when intensity is at its highest, instead of during the warm-up and cool-down. As mentioned above, the music for the most intense part of the workshop was considered to be the most effective. Goal setting at the beginning of the individual class or for the semester or quarter might be a way to aid in improving self-motivation as well.

In addition to the limitations mentioned above, previous research studies on the subject of fitness for dancers did not investigate how to incorporate conditioning of any kind into a dance technique class. Most studies researched the benefits of conditioning for dancers outside of the technique class. While previous research was beneficial in supporting the idea that dancers need supplemental conditioning, and suggesting the types of exercise needed, there were no previous studies to aid as an example for this study.

The study was also limited to a small sample size for participants. A total of six interview subjects from a small region were the only contributors of information from professionals. The first workshop was also a small sample size with only ten participants. This was drastically different from he second workshop which had sixty-five participants. This made the feedback from the first workshop to the second workshop uneven. One of the limitations in dance science research is that of small sample sizes. Future research on this topic should attempt to interview a greater number of professionals in a greater geographical span. This would help to gain a broader sense of what professionals are doing in multiple areas. Increased sample size for workshops would also help to get a more widespread point of view from collegiate level dancers.

This study focused on how and what to incorporate into a dance technique class to increase the fitness of dancers. The study did not measure the physiology of the dancers in any manner. Further research on this topic might consider the inclusion of such measurements to gain

a better understanding of how useful the incorporated conditioning is toward the goal of muscular strengthening and cardiorespiratory development in dancers. It would also be beneficial to implement the workshop design using the commonalities into a regular length dance technique class that was a part of a quarter or semester long course in which students could be measured physiologically at the beginning and end of the course.

In summary, this study has begun to develop a framework for incorporating muscular strengthening and cardiorespiratory conditioning within the modern dance technique class at the college level. This framework is based on information obtained from interviews with dance instructors and supplemental training practitioners, as well as literature. This study found that the incorporation of muscular strengthening and cardiorespiratory training into the technique class using the framework of commonalities is a feasible means of implementing conditioning into the dancer's routine. Continued research on this topic should consider implementing the framework into a regular length dance technique class that is at least a one hour session, and takes place within a quarter or semester long course. This would aid in finding how the exercises can be programmed within the other technical training, and give students an opportunity to begin to adapt to utilizing the RPE scale. Students would also become more comfortable with the exercise combinations allowing for the inclusion of artistry. The ability to be artistic while exercising may eliminate the mindset of conditioning work and open students to improved self-motivation. Active-rest movements should be used to keep students in motion for cardiorespiratory training. The movement should be easy to transition to from other dance or exercise activities and adjustable for intensity. Exercises used in the technique class should be useful toward the dancer's training, and take into account the framework's specifications for intensity, duration,

types of exercises, and amount of rest. The use of ballet barres or other equipment may be considered in order to integrate a variety of ways to enhance musculature. The dance combinations should also evenly exercise the muscles of the body on both sides. Lower-body exercise may be the only area that needs to have more repetition or intensity than other muscles. Instructors need to pay attention to the feedback they receive from their participants to better gauge where the strengths and weaknesses lie. The warm-up should be dance specific, and the cool-down should be longer than five minutes to return the participants to a resting state. Manipulation of the music to emulate the beats-per-minute of the participants' heart rate is a successful way to motivate students. I suggest instructors find an automated way to manage music tempo for easier multitasking. Researchers should aim to continue to build the framework by recruiting a larger pool of interview and workshop participants. Additional information can be gained by measuring physiological adaptations of workshop participants. In closing, the four common themes are a starting point for dance instructors and researchers to develop better conditioning programs into techniques classes.

CHAPTER EIGHT

Conclusion

Previous studies have found that the traditions of dance training in modern dance, as well as in ballet, are not sufficient enough to prepare dancers for the requirements of performance. This gap between practice and performance can cause injury. It also leaves dancers feeling unprepared to perform at their best. Ultimately, the continued increase in performance demands coupled with training based on inherited customs may not serve the growth of the dancer, choreographer, and art form as a whole.

The dancer's body is their tool. It must be refined artistically and physically in order to produce the myriad of movement ideas requested by choreographers. Supplemental conditioning, in excess of technical dance training, has been found to be a beneficial way for dancers to improve their performance abilities. But, many dancers lack the knowledge needed to properly train on their own. Improper training can also cause injury. In addition to the lack of knowledge on physical training outside of the studio, dancers have busy schedules often filled with hours of physical practice in technique classes and rehearsals. It may be difficult for dancers to find extra time and energy to devote to supplemental exercise, which could also result in overtraining, and again, injury.

Collegiate level dancers are often faced with heavy schedules that include academic coursework on top of their physical dance practice and rehearsals. The expectation that these young dancers will make the time to add conditioning work, as well as know how to condition properly, may be optimistic or unrealistic. Many college dance majors rely heavily on the

guidance of their instructors to cultivate their development in preparation for a performance career. In order for dancers to gain the knowledge needed to maintain their bodies, reduce injury, and increase aesthetic competence, it may be important for dance technique classes to include conditioning. Some dance instructors have already begun to do this.

This thesis has explored how to incorporate muscular strengthening and cardiorespiratory conditioning within the collegiate level modern dance technique class. The methodology included a review of literature, interviews, and workshops. Literature included dance science research with a focus on conditioning for dancers. Interviews were conducted with individuals belonging to two categories: dance instructors that have taught modern dance at the college level, and supplemental training practitioners who have worked with dancers. Using information collected from the literature review and interviews, a thirty-minute modern dance workshop was designed. Workshop participants were dance majors at the University of California, Irvine. A survey for feedback was given to participants at the end of the workshop. This feedback was used to revise the original class design. A second workshop was given along with a revised survey in order to compare results.

It was found that incorporating muscular strengthening and cardiorespiratory conditioning into a modern dance technique class is possible, and feasible. Literature and interviews resulted in the finding of four common themes that aided in the development of the workshop. The themes of continuous movement, dance-specific movement, full-body exercise, and near-maximal effort were used. These themes encompassed many other commonalities such as: one-to-one work-to-rest ratio, gradual increase and decrease of intensity, large muscles before small muscles, aerobic movement before anaerobic movement, variations and options for

students, active rest, twenty-minute minimum cardiorespiratory training, Pilates Method, Yoga-style exercise, plyometric exercise, and sixteen repetitions of push-ups or two minutes of arm exercises.

It was found that active rest was a successful way to maintain continuous activity. The dance-specific combinations were more successful when they alternated sides of the body within the combination rather than waiting to reverse the entire combination. Music manipulated to mimic the target beats-per-minute of the heart rate of the dancers aided in motivating the dancers, especially during the most intense portion of the class. A visual RPE scale was more successful than solely the use of verbal cues to aid in gauging intensity level. The warm-up was more beneficial when it used the movements from the forthcoming dance combinations. The cool-down needed to be longer than five minutes in order to bring dancers back to a resting state. It was also found that dancers are able to tolerate more exercise for their legs than other parts of their body. Phrases for smaller muscle groups using mostly floor exercise needed to be more cardiorespiratory by adjusting the combination to move out of the floor. Dancers found that they needed more motivation, and the incorporation of artistry was not always achieved.

Future research on this topic should aim to have a greater number of participants in both interview subjects and workshop participants. Workshops should be incorporated into a regular length dance technique class, and full quarter or semester long courses to allow for better understanding of how the common themes can be developed. Dance students should be tested for physiological adaptations over a regular quarter or semester period.

This study has added to the literature on the topics of dance training and conditioning for dancers. It has begun to develop a framework that dance instructors can use as a way to

practically add conditioning to their dance technique classes. This research contributes to finding ways to reduce injury for dancers, better prepare them for performance, and ultimately progress the art form.

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APPENDIX A: IRB Approved Documents

UCI Office of Research

Institutional Review Board
Human Research Protections
Protocol Narrative ~ Expedited/Full Committee Social/Behavioral/Educational Research
Version February 2017

Upload this completed narrative and any supplemental documentation to the IRB Application.

IRB USE ONLY –
HS#: 2017-3692

Lead Researcher Name: Chelsea Asman

Study Title: *Filling the Gap Between Practice and Performance*

ABSTRACT

Provide a non-technical summary of the proposed research that can be understood by IRB members with varied research backgrounds, including non-scientists and community members. The summary should include a brief statement of the **purpose of the research** and a brief description of the **procedure(s)**. *This summary should not exceed more than 250 words.*

This thesis will explore how to incorporate cardiovascular conditioning and muscular strengthening into a college level modern dance technique class. This research may help to improve the fitness of collegiate level modern dancers, allowing for better overall performance and injury prevention. In addition to these benefits, college level modern dancers will be better prepared to enter the professional dance field.

I will interview a maximum of six collegiate level modern dance teachers and wellness practitioners who work with dancers. These interviews will provide insight into their experiences in incorporating conditioning for dancers and what exercises are most beneficial for dancers. All interview participants will be asked to complete release forms in order to allow for use of materials in thesis.

I will review current dance and exercise science research literature with a focus on dance conditioning to find out the proper frequency, intensity, time, and type of strengthening and cardiovascular conditioning that should be used in a college level modern dance technique class. I will combine the information from the interviews with the information from the literature in order to design a college level modern dance class that incorporates muscular strengthening and cardiovascular conditioning.

Using my class design based on my research, I will give a collegiate level modern dance class incorporating muscular strengthening and cardiovascular conditioning in the form of a thirty minute workshop. At the end of the workshop I will survey the class participants in order to understand the perspective of the college dance major. Based on the survey feedback, I will give a second thirty minute workshop based on a revised class design using the same participants as in the first workshop. Workshop participants will also be asked to sign release forms, which will allow for the use of survey data.

SECTION 1: BACKGROUND AND SIGNIFICANCE OF THE RESEARCH

1. Provide the scientific or scholarly **rationale** for the research. Describe the relevant background information and the specific gaps in current knowledge that this study intends to address.

For the last few decades the dance world has known about the benefits of cross-training dancers in cardiovascular endurance, muscular strengthening, stretching, and corrective exercises to improve muscular or skeletal imbalances and deviations. There is scientific evidence of this knowledge in the works of authors such as Gigi Berardi, Sally Sevey Fitt, Andrea Watkins and Priscilla M. Clarkson dating back to 1990. While the knowledge exists and studies show the increase in performance of dancers who cross-train, there are still many dancers who do not add these elements of exercise science to their regimen. Many previous studies focused more on the cardiovascular component of fitness, rather than the strength component, and all of the sources chose to study or create a regimen that had to be done outside of dance technique classes (see for example, studies by Jennifer Camp and Mary Kathleen Troy).

Many modern dance companies of today demand a high level of physicality. College level dancers who do not find the time outside of the dance technique classes to condition their bodies for this type of work are unprepared to enter the field upon the completion of their degree. Many college dance majors choose not to cross-train outside of the studio, because they either do not have the time within their busy schedules, or they feel they do not have the knowledge to cross-train on their own. I believe that this gap between the collegiate level dance world and professional dance world can be filled by incorporating the proper conditioning into the dance technique class. This research will add to the existing body of knowledge on conditioning for dancers as well as act as a guide for college level modern dance teachers to properly add conditioning into their dance classes.

2. Describe the **purpose, specific aims** or **objectives**. Specify the hypotheses or research questions to be studied.

The purpose of this research is to investigate how to incorporate muscular strengthening and cardiovascular conditioning into a college level modern dance technique class in order to improve the fitness of collegiate level modern dancers to allow for better overall performance and injury prevention.

The aim of this research is to determine what types of strengthening and cardiovascular exercises could be used in a modern dance technique class that would allow benefits for dancers at all levels of fitness. The second aim is to find out what amount of strengthening and cardiovascular conditioning for dancers is needed, and where within the format of the class the conditioning should be placed in order for dancers to receive the most benefit.

The aim is to to design a college level modern dance technique class that incorporates cardiovascular conditioning and muscular strengthening.

Aims:

1. Identify muscular strengthening and cardiovascular conditioning exercises
2. Identify how to incorporate the exercises into the modern dance class
3. Create a collegiate level modern dance class that incorporates muscular strengthening and cardiovascular conditioning

I hypothesize that incorporating cross-training into the technique class will be a more successful way to get dancers to consistently perform the required additional strengthening and cardiovascular conditioning needed to improve their performance abilities.

3. List up to **ten relevant references/articles** to support the rationale for the research.

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2. Camp, Jennifer L. Supplemental Conditioning for Dancers. MFA Thesis. University of California, Irvine, 2002.

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10. Welsh, Tom. Conditioning for Dancers, University Press of Florida, 2009.

SECTION 2: ROLES AND EXPERTISE OF THE STUDY TEAM

Complete the table below (LR: Lead Researcher, FS: Faculty Sponsor, CR: Co-Researcher, RP: Research Personnel). Indicate whether the study team member will be involved in the following research activities.

***Note**: Personnel who are not interacting with participants for research purposes and/or who do not have access to identifiable private information about the research participants (e.g., statisticians) are not engaged in human-subjects research and therefore should not be listed below.*

*If there is a Faculty Sponsor, s/he **must be** listed below (even if s/he is not engaged in human-subjects research), as s/he must be identified to provide oversight and guidance to the Lead Researcher.*

Name	Role	List Department, Title, & Degrees. Include UCI Affiliation - Faculty / Staff, Grad- or Under-Student	Recruitment	Informed Consent Process	Interact with Participants	Access Participant Identifiable Data?	Analyze Participant Identifiable Data?
Chelsea Asman	LR	Dance Department, Graduate Student	Yes	Yes	Yes	Yes	Yes
Dr. Kelli Sharp	FS	Dance Department, Assistant Professor, Faculty	Yes	Yes	Yes	Yes	Yes

A. **Training of Personnel**

1. Describe the training plan that will be provided to your study team members. Who will provide the training, what will be included in the training, how will their level of knowledge be assessed to ensure they are ready to perform their assigned duties, and who will provide ongoing oversight.
2. Please identify who will interact with non-English speaking participants, if applicable.

1. Training will be provided by Dr. Sharp to Mrs. Asman on proper recruitment strategies, consent processes, and interview procedures. Dr. Sharp will meet with Mrs. Asman weekly to discuss research progress and provide guidance.

2. Non-English speakers will not participate in this study.

SECTION 3: RESEARCH PARTICIPANTS

A. **Individuals To Be Enrolled on this UCI protocol (Persons/Records)**

1. Complete the table of participant enrollments below. *Include additional rows for subject category/group, as needed.*
1. If the study involves the use of existing or prospective records, specify the maximum number to be reviewed / collected, and the number needed (i.e., expected to complete study) to address the research question.

Category/Group (e.g., adults, parents, children)	**Age Range** (e.g., 7-12, 13–17, 18 or older)	**Maximum Number to be Consented or Reviewed/Collected**	**Number Expected to Complete the Study**

Interviews/Adults	18 or older	6	4
Workshop/Adults	18 or older	20	15
		Total: 26	

B. **Eligibility Criteria**

1. Identify the criteria for inclusion and exclusion.

Interviews:

- Modern dance technique teachers included in interviews will need to have experience in teaching at a collegiate level. Dance professionals only.
- Wellness practitioners interviewed for this research will need to have experience in working with dancers.

Workshops:

- Dancers participating in workshops will need to be a dance major at the University of California, Irvine.
- All participants in this study must be 18 years of age or older.
- All participants in this study must be English speakers.

2. If eligibility is based on age, gender, pregnancy/childbearing potential, social/ethnic group, or language spoken (e.g., English Speakers only), provide a **scientific rationale**.

[ ] Not applicable: Subject eligibility is not based on these factors.

- Lead researcher is an English speaker and will be performing interviews and leading workshops.

SECTION 4: RECRUITMENT METHODS AND PROCESS

[ ] This study involves no direct contact with participants (i.e., use of existing data, records, charts, specimens). *Skip to Section 6.*

A. Recruitment Process

1. Describe **when, where, by whom** and how potential participants will be approached. If posting on your Facebook page or other social media sites, please explain.
2. If you will recruit by e-mail, phone, etc., explain how the researcher will obtain the participants' **contact information**.
3. Please **attach Advertisements, Flyers, Social Sciences Human Subject Pool (SSHSP) Form, Scripts, Letters, and Announcements**. See Recruitment Guidelines.

***Note**: If recruiting via online sources / social media (i.e., Facebook or Amazon Mechanical Turk (AMT), etc.), submit the statement that will be posted. Refer to participants as 'research participants,' not 'workers'.*

An announcement will be sent via email to colleagues for them to share with contacts they feel would be potential participants. The announcement will also be posted on the social media platform of Facebook. The announcement will include an explanation of the purpose and procedure of the research.

Workshop participants will be recruited through the use of email, and/or the social media platform of Facebook. Flyers will posted on the UCI campus community boards, in classrooms, dance studios, offices, and bathroom stalls in the Claire Trevor School of the Arts.

The rationale for using Facebook as a form of recruitment is that there is a UCI Dance Major page where the information can be posted. This will make the workshop opportunity visible to more dance majors, rather than just majors that are Facebook friends with the lead researcher.

Facebook Post:

Hello UCI Dance Majors - I am currently researching how to incorporate the elements of exercise science such as cardiovascular conditioning and muscular strengthening into a college level modern dance class. If you would like to participate in a 30 minute modern dance workshop, please contact me by email at asmanc@uci.edu. Thank you!

SECTION 5: INFORMED CONSENT PROCESS

1. **Submit the Consent, Study Info Sheet, Courtesy Letter, Assent document(s).** ***Note:** After IRB Approval, distribute to participants the version of the document with the IRB-approval information in the footer.*
2. Describe the specific **steps for obtaining consent**. See **Guidance for Consenting Process**.

Check all that apply:

[X] Written / Signed informed consent will be obtained. (Release Form only)

Customize the Consent for SBE Research.

[X] Oral / Implied informed consent will be obtained (i.e., requesting a waiver from obtaining signed informed consent).

*Customize the **Study Information Sheet** and Complete Appendix P.*

***Note**: If obtaining consent online (e.g., research involves completing a survey electronically administered via AMT, EEE, etc.), participants should:*

- *View the Consent/Study Info Sheet prior to participation*
- *Be prompted to verify they meet the eligibility criteria, and*
- *Indicate their willingness to participate in the research (e.g., click "Yes").*

[ ] Informed consent will NOT be obtained (i.e., requesting a *complete* waiver of informed consent). No contact with participants; using existing data, records, charts, specimens, etc.

Complete Appendix O. Skip to Section 6.

Steps for obtaining consent for Interviews:

1. An announcement will be sent via email to colleagues for them to share with contacts they feel would be potential participants. The announcement will also be posted on the social media platform of Facebook. The announcement will include an explanation of the purpose and procedure of the research.

2. Interested potential participants will be be provided with an IRB approved study information sheet and allowed to ask any questions they have regarding the study.

3. Potential participants will be given time to consider their participation and ask any further questions they may have through email, in person, via Facebook, or by phone.

5. Upon verbal agreement of participation in the study, the participant will also be asked to sign a release form, which will allow for the use of audio recording. Participants may opt out of the study at any time and/or audio-recording, but must sign the release form in order to opt out of the audio-recording.

6. Interview participants may not participate in the workshop, as they should not be UCI Dance Majors

Steps for obtaining consent for Workshop:

1. An announcement of the study will be posted on campus bulletin boards and bathroom stalls as well as on the social media platform of Facebook.

2. Interested potential participants will be provided an IRB approved study information sheet and allowed to ask any questions they have regarding the study.

3. Potential participants will be given time to consider their participation and ask any further questions they may have through email, in person, via Facebook, or by phone.

5. Upon verbal agreement of participation in the study, the participant will also be asked to sign a release form, which will allow for the use of video recording. Participants may opt out of the study at any time. Participants may still participate in the study if they do not sign the release form.

6. Workshop participants may not participate in interviews, since the interview participants must be professionals in the field.

3. UCI Students / Employees: If study team members will approach their own students or employees:
   a. Explain what precautions will be taken to **minimize potential undue influence or coercion.**
   b. Explain **how compromised objectivity will be avoided**.

- Lead researcher will not directly approach students or employees. Lead researcher is a graduate student and does not teach dance majors. Please see consenting process for the workshops above as UCI dance majors will be the potential participants.

4. Children / Minors: If children (anyone less than 18 years old) are participants, please describe the **parent / legal guardian permission** process and the **child assent** process.

N/A

5. Deception: If **deception** is involved, describe the process by which participants will be informed of the true nature of the study after participation has been completed. Please attach a 'Debriefing Script.'

Complete Appendices G (Deception) and *O (Alteration of Consent).*

N/A

6. Release Form: If publications and/or presentations will include **identifiable information**, specify how the study team will obtain permission from participants. Please submit a 'Release Form'

- Research participants will be verbally asked if their identifiable information can be used in the study. If research participants agree to the use of their identifiable information in the study, they will be asked to sign a release form.

7. **Non-English Speaking Participants:** In order to consent participants who are unable to communicate (i.e., read, write, and/or speak) in English, the English version of the consent form must be translated into appropriate language(s) once IRB approval is granted. Please specify in 'Section 2. Study Team' who will be responsible for interacting with non-English speaking participants.

Check all that apply:

[X] Not applicable - Only individuals who can read and speak English are eligible for this study.

[ ] The English version of the consent form will be translated into appropriate languages for non-English speaking participants once IRB approval is granted. An interpreter will be involved in the consenting process. ***Note:*** *After IRB Approval, distribute to participants the version of the document with the IRB-approval information in the footer.*

SECTION 6: RESEARCH METHODOLOGY/STUDY PROCEDURES

A. **Study Design and Procedures**

1. Provide a **description of the proposed research** (e.g., pilot testing, screening, intervention/interaction/data collection, and follow-up) and **procedures** (e.g., surveys, interview, focus group, and observation). See **Guidance for Online Research.**
   a. Specify **where** the research will take please (e.g., UCI, local public schools, international site, private business, etc.).
   b. Include an explanation of the study design (e.g., randomization, cross-sectional, longitudinal, etc.).
   c. Indicate how much **time will be required of the participant**, per visit and in total for the study.
   d. If a procedure will be completed more than once (e.g., multiple visits, pre and post survey), indicate **how many times** and the **time span** between administrations.
   e. If a procedure will occur via a crowdsourcing Internet marketplace (e.g., AMT) or in the cloud (e.g., Google Docs), please describe.
   f. Indicate if study procedures include collecting **photographs** or **audio/video recording**.

The proposed research is to design a collegiate level modern dance technique class using data collected from literature as well as interviews, workshops, and surveys.

a. The UCI campus will be the main location of research for literature review and workshops. Interviews of collegiate level modern dance technique teachers and wellness practitioners will happen off campus at a location convenient to the participant.

b. The research will use both qualitative and quantitative methods of research.

c. Interviews:

The time required of interview participants will be no longer than one hour per visit, with no more than one visit per interviewee, making the total time per interview participant 1 hour. Interview participants will be asked to sign a release form for use of information given in the interview for research publication and presentation. The release form will also give the lead researcher permission to use an audio recording device during the interview. Audio recording will be optional. Interview participants will still be allowed to participate in the interview if they opt out of the audio recording, but they must sign the release form in order to opt out of the audio recording.

Workshops:

Workshop participants will be asked to participate in two 30 minute workshops and complete a survey at the end of each workshop. The survey will take no longer than 15 minutes to complete. The total time of one workshop and survey session will be 45 minutes, making the workshop participant's total time for the two sessions 1.5 hours.

d. The second workshop will be held within a few weeks after the first workshop.

e. N/A

f. The study procedures for interviews will include audio recordings, and the study procedures of the workshops will include video recordings.

2. **Off-Site Research –**
   a. See **Guidance for Letter(s) of Permission**
   b. See **Template Letter of Permission**

[X] Check here to confirm Letter(s) of Permission has been / will be obtained and kept on file.

B. **Measures / Data Sources**

1. List the measures that will be administered or data sources that will be accessed.
2. Submit **data collection instruments** (e.g., data abstraction sheet listing the variables that will be collected/analyzed for records reviews, measures, questionnaires, list of interview or focus group questions, observational tool, etc.).

Interviews:

1. I will conduct interviews of college level modern dance teachers and wellness practitioners who work with dancers in regards to dance conditioning.

2. Data collection instruments will include an audio recording device and open ended questions.

Interview questions for college level modern dance technique teachers:

- Have you ever tried to incorporate conditioning into your dance classes at the college level?
- What exercises did you choose to incorporate, what was the goal of the exercise and why did you choose that particular exercise?
- How long did the exercise last, or how many repetitions did you ask the dancers to do?
- How did you decide on the length of the exercise?
- What challenges did you run into when incorporating conditioning into your modern dance technique class? Did you find that dancers were at different fitness levels, and if so, how did you work around that?
- Where, within the structure of the class, did you decided to do the conditioning exercises?
- Why do you think it is important to incorporate conditioning for dancers into the modern dance technique class at the college level?

Interview questions for wellness practitioners who work with dancers:

- What issues, in regards to dance conditioning, do you find in common with most collegiate level modern dancers?
- What exercises would you recommend be incorporated into a modern dance technique class at the college level?
- Why would you recommend these particular exercises?
- Where, within the format of the class, do you recommend these exercises become incorporated in order for dancers to receive the most benefit?
- How many repetitions, or for what length of time should the dancers perform the exercise in order to receive the most benefit?
- Do you think it is important for cardiovascular conditioning and muscular strengthening to be incorporated into the modern dance technique class? why?

Workshops:

1. I will conduct two 30 minute workshops in which I will test my design of a college level modern dance class that incorporates cardiovascular conditioning and muscular strengthening. I will administer a post-workshop survey to workshop participants.

2. Video recording devices and satisfaction surveys will be used to collect data.

IMPORTANT TIME SAVER: PLEASE ATTACH *ALL* MEASURES FOR REVIEW. APPLICATIONS ARE INCOMPLETE AND WILL NOT BE REVIEWED UNLESS MEASURES ARE PROVIDED.

SECTION 7: RISK ASSESSMENT AND POSSIBLE BENEFITS

A. Level of Risk

Place an "**X**" in the bracket **[ ]** next to the level of review (based upon the investigator's risk assessment).

[ ] This study involves **greater than minimal risk** and requires **Full Committee review.**

[X] This study involves **no more than minimal risk** and qualifies as **Expedited research**.

B. Risks and Discomforts

1. Describe the **risks/potential discomforts** (e.g., emotional reaction from personal or sensitive information included in surveys, interviews, focus group, etc.; embarrassment or stigma; invasion of privacy) associated with **each** intervention or research procedure.

- A potential discomfort of interviews is invasion of privacy. This is not of significant risk as subject matter is based on career experience.
- Potential discomforts of workshops are no more risk than in a typical dance class or workout.

[X] This study involves the collection of participant identifiable data (even if temporary such as for recruitment or compensation purposes), and as such, a breach of confidentiality is a risk associated with the research.

2. Discuss what steps have been taken and/or will be taken **minimize and prevent** any risks/potential discomforts described above.

- Injury to workshop participants will be minimized by allowing participants the ability to stop or slow down if they feel any pain or abnormal physical discomforts.
- A breach of confidentiality will be minimized by locking up data, and allowing access by only lead researcher and faculty sponsor.

C. Potential Benefits

Discuss the potential benefits directly **to the participant and to society**. **Compensation (i.e., gift cards, cash, course credit, etc.) is *not* a benefit.**

[X]

- Workshop participants may benefit from the opportunity to learn about ways to incorporate cardiovascular conditioning and muscular strengthening into their personal dance practice, or into their practice as teachers.
- There is no direct benefit to interview participants.
- Benefits to others or society include adding to the existing body of knowledge on conditioning for dancers as well as act as a guide for college level modern dance teachers to properly add conditioning into their dance classes.

SECTION 8: PARTICIPANT COMPENSATION AND REIMBURSEMENT

1. If participants will be compensated (e.g., money, extra credit, etc.) for their time and effort, indicate the method/type (i.e., cash, check, gift certificate, etc.) and **exact amount**.
2. Indicate **when** compensation be provided (e.g., directly after participating in the interview, within two weeks) **and how** it will be provided (e.g., in person, by mail, emailed an electronic gift card code)?
3. Compensation should be offered on a **prorated basis** when the procedures involve multiple sessions. Provide a **breakdown of the amount, specifying for which exact procedure it pertains, and the total amount** that may be given.
4. Specify whether subjects will be reimbursed for out-of-pocket expenses (i.e., parking fees, transportation, etc.). If so, describe any requirements for reimbursement (e.g., receipt).

[ ] Not applicable - This study involves no interaction/intervention with participants (i.e., involves the use of data, records, charts, specimens).

[X] No compensation will be provided to participants.

[X] No reimbursement will be provided to participants.

OR

<Type here>

SECTION 9: CONFIDENTIALITY OF RESEARCH DATA

1. Will researchers maintain any participant identifiers? Check all that apply:

[ ] Participant identifiers are not maintained (i.e., researchers will not collect information that can link the participant to their data)

OR

[X] Names	**[ ]** Social Security Numbers	**[ ]** Device identifiers/Serial numbers
[] Dates*	**[ ]** Medical record numbers	**[ ]** Web URLs
[ ] Postal address	**[ ]** Health plan numbers	**[ ]** IP address numbers
[X] Phone numbers	**[ ]** Account numbers	**[ ]** Biometric identifiers
[ ] Fax numbers	**[ ]** License/Certificate numbers	**[ ]** Facial Photos/Images
[X] Email address	**[ ]** Vehicle id numbers	**[ ]** Any other unique identifier

[ ] Other (Specify all): <Type here>

* birth date, treatment/hospitalization dates

2. Indicate **how identifiable data will be recorded, stored, secured.**

   Note: *If the research data includes identifiable private information the storage devices or the electronic research files must be encrypted. [For guidance on the use of cloud services, please review the UCI OIT policy.]*

[ ] No identifiers will be maintained

[ ] Biological specimens

[ ] Other(s) (specify):

Electronic Data (check all that apply):

[ ] Coded data; code key is kept separate from data in secure location.
[ ] Data includes identifiable information. ***Note:*** *Encryption software is required.* Provide rationale for maintaining identifiable info**:** <Type here>
[ ] Data will be stored on secure network server.
[ ] Data will be stored on stand-alone desktop computer (not connected to network/internet)
[ ] Data will be stored in the cloud (specify source providing service): <Type here>
[X] Other (specify here): Data will be stored on a password protected laptop computer.

Hardcopy Data, Recordings and Biospecimens (check all that apply):

[ ] Coded data; code key is kept separate from data in secure location.
[ ] Data includes identifiable information. Provide rationale for maintaining identifiable info**:** <Type here>
[X] Data will be stored in locked file cabinet or locked room at UCI/UCIMC.
[ ] Data will be stored locked lab/refrigerator/freezer at UCI/UCIMC.
[ ] Other (specify here): <Type here>

Data on Portable Devices:

5. Specify whether participant **identifiable data** will be stored on the device. If so, **explain why** it is necessary to store identifiers on the device.
6. Describe the **portable device(s) to be used** (e.g. audio/video recording device, tapes, cameras, mobile phones / iPhone, laptop, tablet, portable hard drive including USB flash drives).
7. Explain how long the identifiable data will be maintained on the portable device.

Note: *Only the "minimum data necessary" should be stored on portable devices as these devices are particularly susceptible to loss or theft, thus creating a source for potential breach of confidentiality. If there is a necessity to use portable devices for initial collection of identifiable private information, the portable storage devices or the research files* ***MUST BE ENCRYPTED****, and identifiers transferred to a secure system as soon as possible.*

[ ] Not applicable – No study data will be maintained on portable devices.

OR

- Identifiable data will be stored on a portable device. It is necessary to store the identifiable data on this device, as it will be easily accessible to the lead researcher.
- The identifiable data will be transferred from a digital audio recorder to a password protected laptop computer.
- The identifiable data will be maintained on the password protected laptop computer for approximately one year, until the completion of the thesis research writing in July of 2018.

Data Retention:

8. Explain **how long participant identifiers** will be **retained**. This includes the key code linking the data to the participants.

Note: *If more than one of the options below is applicable [e.g., the study involves children], records should be kept for the longer period.*

[ ] Not applicable. No identifiers are retained.

[ ] Destroy once its purposes has been served (e.g., for recruitment, after compensation granted)

[ ] Destroy once data collection/analysis is complete.

[X] Destroy after publication/presentation.

[ ] Maintain for approximately (e.g., 3 months, etc.)

[ ] Maintain indefinitely. Other researchers may have access to de-identified data for future research.

Note: ***Appendix M is required if identifiable data will be shared with non-UCI Researchers.***

[ ] Identifiable research records will be retained for seven years after all children enrolled in the study reach the age of majority [age 18 in California] as this study includes children.

[ ] Other: <Type here>

Data Destruction of Recordings / Photographs: If subject identifiable audio or video recordings or photographs will be collected, specify the timeframe for the transcription and describe retention / destruction plans.

[ ] Not applicable – No audio/video recordings or photographs will be collected.

[ ] Audio or video recordings transcribed and de-identified; specify time frame: <Type here>

[ ] Audio or video recordings maintained with identifiers; specify time frame: <Type here>

[X] Audio or video recordings destroyed; specify time frame: Audio recordings will be destroyed by July of 2018.

[ ] Photographs maintained with identifiers; specify time frame: <Type here>

[ ] Photographs destroyed; specify time frame: <Type here>

Certificate of Confidentiality:
Specify whether a Certificate of Confidentiality (COC) has been or will be requested from the National Institutes of Health (NIH). If yes, explain in what situations personally identifiable information protected by a COC will be disclosed by the UCI study team.

Note: *If the COC has been secured, provide a copy of the COC Approval Letter with your IRB application or provide it to the IRB upon receipt.*

[X] Not applicable – No COC has been requested for this study.

OR

<Type here>

Announcing a UCI MFA Research Project

"Filling the Gap Between Practice and Performance"

Chelsea Asman, an MFA candidate at the University of California, Irvine in the Dance Department at the Claire Trevor School of the Arts is researching how to incorporate cardiovascular conditioning and muscular strengthening into a college level modern dance technique class. This research may help to improve the fitness of collegiate level modern dancers, allowing for better overall performance and injury prevention.

You are eligible to participate in this study if you are at least 18 years of age or older, an English speaker and have taught modern dance technique classes at the collegiate level or are a wellness practitioner who works with dancers. The study will take place at a location of your convenience and will last no more than one hour. As part of participating, you will be asked to answer interview questions relating to your experience in working with dancers. You will not be paid for your participation in this research. If you participate, there is no anticipated direct benefit.

If you are interested in participating in this study, please contact Chelsea at asmanc@uci.edu or by phone at (909) 260-2997.

Chelsea Asman
asmanc@uci.edu
(909) 260-2997
Lead Researcher
MFA Dance Candidate

Thesis Chair:
Dr. Kelli Sharp, Dance Department
Claire Trevor School of the Arts
ksharp@uci.edu

University of California, Irvine
Study Information Sheet

Filling the Gap Between Practice and Performance

Lead Researcher
Chelsea Asman, Graduate Student
Dance Department
(909) 260-2997
asmanc@uci.edu

Faculty Sponsor
Kelli Sharp, DPT Dance Science
Dance Department
ksharp@uci.edu

- We are asking you to take part in a research study being done by researchers at the University of California, Irvine.

- We would like to interview you to learn more about your experience with the teaching of collegiate level modern dance classes and incorporation of dance conditioning exercises, or your experience as a wellness practitioner working with dancers.

- The interview will last about one hour and will take place at a location of your convenience

- Prior to the start of the interview you will be asked to sign a release form. This form will allow for the use of audio recording during the interview, as well as the use of information given in the interview for research purposes including publication and presentation. You will have the option to opt-out of audio recording if you wish. If you choose not to be recorded, you may still participate in the interview, but in order to opt out of the audio recording you must sign the release form.

- You may experience potential discomfort from the interview, but you can skip questions that you do not want to answer or stop the interview at any time.

- There is no direct benefit to participating in the study. Benefits to others or society may include adding to the existing body of knowledge on conditioning for dancers as well as act as a guide for college level modern dance teachers to properly add conditioning into their dance classes.

- We will keep the data we collect confidential, and we will not share your personal information with anyone outside the research team. All data will be maintained until the completion of research by July of 2018.

- Participating in this study is optional. Please tell the researcher if you do not want to participate.

- You will not be compensated for your participation in this research study.

- Questions? If you have any comments, concerns, or questions regarding this study please contact the researchers listed at the top of this form.

- If you have questions or concerns about your rights as a research participant, you can contact the UCI Institutional Review Board by phone, (949) 824-6662, by e-mail at IRB@research.uci.edu or at 141 Innovation, Suite 250, Irvine, CA 92697.

- **What is an IRB?** An Institutional Review Board (IRB) is a committee made up of scientists and non-scientists. The IRB's role is to protect the rights and welfare of human subjects involved in research. The IRB also assures that the research complies with applicable regulations, laws, and institutional policies.

- Participation in this study is voluntary. There is no cost to you for participating. You may choose to skip a question or a study procedure. You may refuse to participate or discontinue your involvement at any time without penalty. You are free to withdraw from this study at any time. **If you decide to withdraw from this study you should notify the research team immediately**.

Interview Release Form

You have been asked to participate in a study titled "Filling the Gap Between Practice and Performance". The information provided in your interview is for research purposes. Your interview will be recorded using an audio recording device to be used by the lead researcher. By signing this form, you agree to allow the researcher to use your name and the information you provide for publication and/or presentations.

For questions, please contact:

Chelsea Asman, Lead Researcher
asmanc@uci.edu
(909) 260-2997

Dr. Kelli Sharp, Faculty Sponsor
ksharp@uci.edu

I consent to the use and release of my personal information provided in the interview:

Signature: _____

Printed Name: _____

Date: _____

I consent to the use of audio recording during my interview ___
I choose to opt-out of audio recording during my interview ___

Signature: _____

Printed Name: _____

Date: _____

Thank you!
We appreciate your participation.

FILLING THE G A P
BETWEEN PRACTICE AND PERFORMANCE

Thesis research study with 2nd year
MFA Dance Candidate Chelsea Asman

Modern Dance Technique & Conditioning

The purpose of this research study is to design a college level modern dance class that incorporates muscular strengthening and cardiovascular conditioning in order to improve fitness and prevent injury in dancers. This study will include participation in two 30 minute dance conditioning workshops. Participants will not be compensated.

If you are interested in participating in this study, please contact Chelsea Asman at asmanc@uci.edu.

Thesis Chair: Dr. Kelli Sharp, Dance Department,
Claire Trevor School of the Arts | ksharp@uci.edu

Filling the Gap Study Chelsea Asman asmanc@uci.edu.
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Filling the Gap Study Chelsea Asman asmanc@uci.edu.
Filling the Gap Study Chelsea Asman asmanc@uci.edu.
Filling the Gap Study Chelsea Asman asmanc@uci.edu.

Hello UCI Dance Majors - I am currently researching how to incorporate the elements of exercise science such as cardiovascular conditioning and muscular strengthening into a college level modern dance class. If you would like to participate in a 30 minute modern dance workshop, please contact me by email at asmanc@uci.edu. Thank you!

University of California, Irvine
Study Information Sheet

Filling the Gap Between Practice and Performance

Lead Researcher
Chelsea Asman, Graduate
Dance Department
(909) 260-2997
asmanc@uci.edu

Faculty Sponsor
Kelli Sharp, DPT Dance Science
Dance Department
ksharp@uci.edu

- You are being asked to participate in a research study. The purpose of this research is to improve the fitness of collegiate level modern dancers in order to allow for better overall performance and injury prevention. This will more aptly prepare dancers to enter today's highly physical dance field.
- You are eligible to participate in this study if you are at least 18 years of age, an English speaker, and a dance major at UCI.
- The research procedures involve participating in two 30 minute workshops. Both workshops will be held on the UCI campus in the Claire Trevor School of the Arts. At the end of each workshop participants will be asked to complete a short survey that will take no longer than 15 minutes to complete. The workshops will be filmed for use by the lead researcher.
- Possible risks/discomforts associated with the study are no more than in a typical dance class or workout. If participants are feeling any pain or discomfort they will be allowed to go at their own pace or stop if needed.
- The possible benefits you may experience from the procedures described in this study include learning about ways to incorporate cardiovascular conditioning and muscular strengthening into personal dance practice or teaching practice. Benefits to Others or Society include adding to the existing body of knowledge on conditioning for dancers as well as act as a guide for college level modern dance teachers to properly add conditioning into their dance classes.
- You will not be compensated for your participation in this research study.
- You will be asked to sign a release form allowing for the use of video recording during the workshop to be used for presentation and/or publication of research. You may opt out of the study at any time and may still participate in the study if you wish to not be video recorded.
- All research data collected will be stored securely and confidentially on a password protected laptop computer or in a locked cabinet or room at UCI. Video recordings are for use by research team only and will be transferred within one week of workshops to a password protected laptop computer and will be maintained until the completion of research by July of 2018.
- If you have any comments, concerns, or questions regarding the conduct of this research please contact the researchers listed at the top of this form.

- Please contact UCI's Office of Research by phone, (949) 824-6662, by e-mail at IRB@research.uci.edu or at 141 Innovation Drive, Suite 250, Irvine, CA 92697 if you are unable to reach the researchers listed at the top of the form and have general questions; have concerns or complaints about the research; have questions about your rights as a research subject; or have general comments or suggestions.

- **What is an IRB?** An Institutional Review Board (IRB) is a committee made up of scientists and non-scientists. The IRB's role is to protect the rights and welfare of human subjects involved in research. The IRB also assures that the research complies with applicable regulations, laws, and institutional policies.

- Participation in this study is voluntary. There is no cost to you for participating. You may choose to skip a question or a study procedure. You may refuse to participate or discontinue your involvement at any time without penalty. You are free to withdraw from this study at any time. **If you decide to withdraw from this study you should notify the research team immediately**.

Workshop Release Form

You have been asked to participate in a study titled "Filling the Gap Between Practice and Performance". The workshops you will participate in are for research purposes and will be filmed for use by the lead researcher. By signing this form, you agree to allow the lead researcher to film you in the workshop and to use footage in publication/presentation.

For questions, please contact:

Chelsea Asman, Lead Researcher
asmanc@uci.edu
(909) 260-2997

Dr. Kelli Sharp, Faculty Sponsor
ksharp@uci.edu

I consent to the use of audio/visual recording equipment:

Your signature: _____

Please Print Your Name: _____

Date: _____

Thank you!
We appreciate your participation.

APPENDIX B: Dance Instructor Interview Questions

University of California, Irvine

Dance Instructor Interview Questions

Filling the Gap Between Practice and Performance

Lead Researcher
Chelsea Asman, Graduate Student
Dance Department
(909) 260-2997
asmanc@uci.edu

Faculty Sponsor
Kelli Sharp, DPT Dance Science
Dance Department
ksharp@uci.edu

- Have you ever tried to incorporate conditioning into your dance classes at the college level?
- What exercises did you choose to incorporate, what was the goal of the exercise and why did you choose that particular exercise?
- How long did the exercise last, or how many repetitions did you ask the dancers to do?
- How did you decide on the length of the exercise?
- What challenges did you run into when incorporating conditioning into your modern dance technique class? Did you find that dancers were at different fitness levels, and if so, how did you work around that?
- Where, within the structure of the class, did you decided to do the conditioning exercises?
- Why do you think it is important to incorporate conditioning for dancers into the modern dance technique class at the college level?

APPENDIX C: Supplemental Training Practitioner Interview Questions

University of California, Irvine

Wellness Practitioner Interview Questions

Filling the Gap Between Practice and Performance

Lead Researcher
Chelsea Asman, Graduate Student
Dance Department
(909) 260-2997
asmanc@uci.edu

Faculty Sponsor
Kelli Sharp, DPT Dance Science
Dance Department
ksharp@uci.edu

• What issues, in regards to dance conditioning, do you find in common with most collegiate level modern dancers?

• What exercises would you recommend be incorporated into a modern dance technique class at the college level?

• Why would you recommend these particular exercises?

• Where, within the format of the class, do you recommend these exercises become incorporated in order for dancers to receive the most benefit?

• How many repetitions, or for what length of time should the dancers perform the exercise in order to receive the most benefit?

• Do you think it is important for cardiovascular conditioning and muscular strengthening to be incorporated into the modern dance technique class? why?

APPENDIX D: Common Themes from Literature and Interviews

Combined Themes from Literature and Interviews

- Warm-up
    - Continuous movement
    - Progress from
        i. Large muscles to small muscles
        ii. Slow to rapid movement

- Class
    - Strengthening during and after warm-up
    - Cardio after warm-up and throughout class
    - Aerobic before anaerobic
    - Full body conditioning (core/upper/lower)
    - Work mid-top range of class
    - Should increase over time/course
    - Allow rest and variation
    - Continuous
    - Dance specific
    - Keep moving during rest, active rest

    - Cardio
        - 12-45 minutes/20-40 minutes
        - 70-90% Max HR
        - Use dance combination

    - Strength
        - Pilates, Yoga, Circuit, Interval, Plyometric
        - Large muscles before small muscles
        - Near max effort/intensity, 70-100%, push to fatigue
        - High reps, low resistance
            - Yoga - 3-5 reps
            - Push-ups - 16 reps
            - Other arm work - 2-8 minutes
            - Depends on the individual and the group
            - Maintain form and alignment

APPENDIX E: Video Library

5.1 Workshop #1 - Active Rest - https://youtu.be/SoWqhHTd-B0

5.2 Workshop #1 - Warm-up - Rolling Improvisation - https://youtu.be/KlafpRqffYo

5.3 Workshop #1 - Warm-up - Weight into Hands, Slow - https://youtu.be/DITSjACV4zo

5.4 Workshop #1 - Warm-up - Weight into Legs, Slow - https://youtu.be/-bh5SBpjFc0

5.5 Workshop #1 - Warm-up - Weight into Hands, Fast - https://youtu.be/o4JLuiHAChE

5.6 Workshop #1 - Warm-up - Weight into Legs, Fast - https://youtu.be/SY7FLyjr1Qw

5.7 Class Design - Movement Phrase #1 for Large Muscles - https://youtu.be/H8ihy7hX-zY

5.8 Workshop #1 - Movement Phrase #1 - https://youtu.be/SqInVrmUkRc

5.9 Class Design - Movement Phrase #2 - https://youtu.be/mMEPKj_WyAE

5.10 Workshop #1 - Movement Phrase #2 - https://youtu.be/n_yfgUOOaSQ

5.11 Workshop #1 - Cool-down - Weight into Legs, Fast - https://youtu.be/oWl5kNCMohQ

5.12 Workshop #1 - Cool-down - Weight into Hands, Fast - https://youtu.be/jLhq_41jpfo

5.13 Workshop #1 - Cool-down - Weight into Legs, Slow - https://youtu.be/5FU_pn3uzxk

5.14 Workshop #1 - Cool-down - Weight into Hands, Slow - https://youtu.be/I_DLCky5O-8

5.15 Workshop #1 - Cool-down - Rolling Improvisation - https://youtu.be/K7JnHE2PQSo

6.1 Workshop #2 - Active Rest - Seated Twist - https://youtu.be/NKC_qLet84s

6.2 Workshop #2 - Warm-up - V-sits - https://youtu.be/EKuq0kIlSEk

6.3 Workshop #2 - Warm-up - Back Extensions -

6.4 Workshop #2 - Warm-up - Biceps Curls - https://youtu.be/pSSJrLNqhbU

6.5 Workshop #2 - Warm-up - Diamond Push-ups - https://youtu.be/m4m5YlZGKfc

6.6 Workshop #2 - Warm-up - Squats - https://youtu.be/AFHCpXTIZNQ

6.7 Revised Class Design - Movement Phrase #1 - https://youtu.be/IOjyOynpyUM

6.8 Workshop #2 - Movement Phrase #1 - https://youtu.be/QXJ2u5FHKeE

6.9 Revised Class Design - Movement Phrase #2 - https://youtu.be/7aGE-xbR8cE

6.10 Workshop# 2 - Movement Phrase #2 - https://youtu.be/W4gmSXwG2So

6.11 Workshop# 2 - Cool-down - Biceps Curls - https://youtu.be/ThP78DqIRI8

6.12 Workshop# 2 - Cool-down - Squats - https://youtu.be/PLRDVKG6lKM

6.13 Workshop# 2 - Cool-down - Diamond Push-ups - https://youtu.be/0a3ctdhT8vQ

6.14 Workshop# 2 - Cool-down - Back Extensions - https://youtu.be/p5-UKSQs1B4

6.15 Workshop# 2 - Cool-down - V-sits - https://youtu.be/h4Vr6OMmLtA

6.16 Active Rest - High Knees - https://youtu.be/pOv-W4BicxU

APPENDIX F: Workshop #1 Survey

University of California, Irvine

Filling the Gap Between Practice and Performance

Workshop Survey

Answer the following questions by circling the number that best indicates your answer, 10 being the most positive and 1 being the least positive. Add any additional feedback in the spaces provided.

1. How sufficient was the warm-up to prepare you for the class activities that followed?
   (10 = Very Sufficient, 1 = Not Sufficient)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

2. How easily did the class flow from one segment to the next?
   (1 = Not Easily, 10 = Very Easily)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

1

3. How effective was the music used in the class?
   (1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____
_____

4. How suitable was the music for the exercises? (1 = Not Suitable, 10 = Very Suitable)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

5. How effective was the music at helping to motivate you?
   (1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

6. How effective were the cues given by the instructor? (1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

7. How effective was the class at incorporating muscular strengthening?
(10 = Very Effective, 1 = Not Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

8. How effective was the class at incorporating cardiovascular conditioning?
   (10 = Very Effective, 1 = Not Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

9. How challenging were the exercises in the first movement phrase?
   (10 = Very Challenging, 1 = Not Challenging)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

10. How challenging were the exercises in the second movement phrase?
    (10 = Very Challenging, 1 = Not Challenging)

1	2	3	4	5	6	7	8	9	10

4

Comments:

_____
_____
_____
_____
_____
_____

11. How motivated did you feel during the class? (1 = Not Motivated, 10 = Very Motivated)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

12. How well were you able to maintain your artistry while participating in the class?
(1 = Not Well, 10 = Very Well)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____
_____

5

13. How effective was the cool-down at bringing you back to a resting state?
(1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____

14. How fatigued or energized did you feel at the end of the class?
(1 = Very Fatigued, 10 = Very Energized)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____
_____
_____

Thank you for participating!

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APPENDIX G: Workshop #2 Survey

University of California, Irvine

Filling the Gap Between Practice and Performance

Workshop #2 Survey

Answer the following questions by circling the number that best indicates your answer. Add any additional feedback in the spaces provided.

1. How sufficient was the warm-up to prepare you for the class activities that followed? (1 = Not Sufficient, 10 = Very Sufficient)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

2. Was the class continuous? (1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

3. Was the music used during the class effective at helping to motivate you to push yourself to near maximal effort? (1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

4. How effective were the cues given by the instructor? (1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

5. How effective was the class at incorporating muscular strengthening?
(1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

6. How effective was the class at incorporating cardiovascular conditioning?
(1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

7. Did you feel muscular fatigue during the first movement phrase?
(1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

8. Did you feel muscular fatigue during the second movement phrase?
   (1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

9. Did you feel out of breath during the first movement phrase?
   (1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

10. Did you out of breath during the second movement phrase?
    (1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

11. How difficult were the exercises in the first movement phrase?
(1 = Easy, 10 = Very Difficult)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

12. How difficult were the exercises in the second movement phrase?
(1 = Easy, 10 = Very Difficult)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

13. Did you feel as if you got a full body workout? (1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

14. Were the movements used in the class dance specific?
(1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

4

Comments:

_____
_____
_____

15. Were the movements used in class purposeful to dance?
(1 = Not At All, 10 = Very Much So)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

16. How motivated did you feel during the class? (1 = Not Motivated, 10 = Very Motivated)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

17. How well were you able to maintain your artistry while participating in the class?
(1 = Not Well, 10 = Very Well)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

18. How heavily were you breathing after the cool-down?
(1 = Regular Resting Breath , 10 = Very Heavy)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

19. How effective was the cool-down at helping you to slow your breathing? (1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

20. How effective was the rate of perceived exertion scale at helping you to gauge your energy level? (1 = Not Effective, 10 = Very Effective)

1	2	3	4	5	6	7	8	9	10

Comments:

_____
_____
_____

21. How well do you think you would be able to perform regular dance technique exercises if this workshop was incorporated into a regular length dance technique class?
(1 = Not Well At All, 10 = Very Well)

1	2	3	4	5	6	7	8	9	10

Comments:

_____

_____

_____

Thank you for participating!

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APPENDIX H: Workshop #1 Notes

TIME (minutes)	EXERCISE	REFERENCE	MUSIC	BEATS PER MINUTE	EXERCISE INTENSITY/RATE OF PERCEIVED EXERTION	ACTIVE REST
(1:00 - 5:00), 5 min.	Warm-up: Improvisations traveling across the floor and circulating from upstage to downstage, so there is constant movement, no waiting on the side.	**Continuous movement** (Rafferty, Welsh, Irvine), **5 minutes** (Johnson), **gradual progression** (Fitt, Plastino, Welsh)		Using Tempo Magic app to adjust the bpm of the songs	Gradually increasing intensity from resting to active, 2-6 on scale of 1-10	High knees or boxers (optional)
(0:00 - 1:00), 1 min.	Improvisation - rolling, slow		Lovely Day by Bill Withers	**70 bpm** (Average Resting HR)	2 on scale of 1-10	High knees or boxers (optional)
(1:00 - 2:00), 1 min.	Improvisation - push/pull, weight into the hands, moving slowly		Lovely Day by Bill Withers	**82 bpm** (In order to gradually progress from resting at 70 bpm to 118 bpm, the next four intervals of warm-up will increase by 12)	3 on scale of 1-10	High knees or boxers (optional)
(2:00 - 3:00), 1 min.	Improvisation - weight into the legs, push/pull, moving slowly		Lovely Day by Bill Withers	**94 bpm**	4 on scale of 1-10	High knees or boxers (optional)
(3:00 - 4:00), 1 min.	Improvisation - weight into the hands, push/pull, faster		Lovely Day by Bill Withers	**106 bpm**	5 on scale of 1-10	High knees or boxers (optional)
(4:00 - 5:00), 1 min.	Improvisation - weight into legs, push/pull, faster		Lovely Day by Bill Withers	**118 bpm**	6 on scale of 1-10	High knees or boxers (optional)

TIME (minutes)	EXERCISE	REFERENCE	MUSIC	BEATS PER MINUTE	EXERCISE INTENSITY/RATE OF PERCEIVED EXERTION	ACTIVE REST
(5:00 - 25:00), 20 min.	Strength and Cardio: Phrases taught in progression of difficulty, students will perform the phrase in smaller groups	**Continuous** (Plastino, Fitt) **Dance Specific Movement** (Welsh, Rafferty, Wyon) **Large Muscles Before Small Muscles** (Koutedakis, Wilmerding and Krasnow, Watkins) **Near Max Effort** (Fitt, Wilmerding and Krasnow, Clippenger-Robertson, Rafferty) **Cardio 20 min.** (Johnson, Koutedakis and Jamurtas, Wilmerding and Krasnow, Fitt, Welsh) **Active Rest** (Wyon, Irvine et al., Plastino)		Between 118-181 bpm using 220-age formula	7-10 on scale of 1-10	High knees or boxers (optional)

TIME (minutes)	EXERCISE	REFERENCE	MUSIC	BEATS PER MINUTE	EXERCISE INTENSITY/RATE OF PERCEIVED EXERTION	ACTIVE REST
(5:00 - 15:00), 10 min.	Phrase #1 - (Large muscles - Quads, gluts, hamstrings, Pecs, lats, shoulders, back extensors) - phrase progresses in intensity, phrase should be repeated in full between 3-5 times. Phrase begins with side lunges, into back extension with push-ups, tricep push-ups, diamond push-ups for latissimus dorsi, inversion for shoulder strengthening, forward scissor lunges/jump lunge, single leg squat, and jump squat (all done on one side and then learned on the opposite side.		Shots Fired by Le Castle Vania	**118 - 181 bpm** (Increase in increments of 12-13 for each full run of the choreography, or throughout the 10 minute section of phrase work - +12 each increment is as follows: **118, 130, 142, 154, 166, 178**	Near Maximal, 7-10 on scale of 1-10	High knees or boxers (optional)
(15:00 - 25:00), 10 min.	Phrase #2 - (Small muscles - abs, biceps, triceps) includes v-sit, also called teaser in Pilates, body weight biceps curl, Yoga style plank abdominal exercise, and dips		Wade in the Water by Eva Cassidy	**118 - 181 bpm** (Increase in increments of 12-13 for each full run of the choreography, or throughout the 10 minute section of phrase work - +12 each increment is as follows: **118, 130, 142, 154, 166, 178**	Near Maximal, 7-10 on scale of 1-10	High knees or boxers (optional)

TIME (minutes)	EXERCISE	REFERENCE	MUSIC	BEATS PER MINUTE	EXERCISE INTENSITY/RATE OF PERCEIVED EXERTION	ACTIVE REST
(25:00 - 30:00), 5 min.	Cool-down: Improvisations traveling across the floor and circulating from upstage to downstage, so there is constant movement, no waiting on the side.	**Gradual Regression** (Welsh, Fitt)			Bringing down to resting gradually from 6-2 on scale of 1 -10	High knees or boxers (optional)
(25:00 - 26:00), 1 min.	Improvisation - weight into the legs, push/pull, moving quickly		Zero by Yeah Yeah Yeahs	**118 bpm**	6 on scale of 1-10	High knees or boxers (optional)
(26:00 - 27:00), 1 min.	Improvisation - weight into hands, push/pull, moving quickly		Zero by Yeah Yeah Yeahs	**106 bpm**	5 on scale of 1-10	High knees or boxers (optional)
(27:00 - 28:00), 1 min.	Improvisation - weight into the legs, push/pull, moving more slowly		Zero by Yeah Yeah Yeahs	**94 bpm**	4 on scale of 1-10	High knees or boxers (optional)
(28:00 - 29:00), 1 min.	Improvisation - weight into the hands, push/pull, moving more slowly		Zero by Yeah Yeah Yeahs	**82 bpm**	3 on scale of 1-10	High knees or boxers (optional)
(29:00 - 30:00), 1 min.	Improvisation - rolling, slow		Zero by Yeah Yeah Yeahs and/or Pumped Up Kicks by Torches if 1st song runs out	**70 bpm**	2 on scale of 1-10	High knees or boxers (optional)

APPENDIX I: Workshop #2 Notes

Amount of time on activity	Exercise	Music Tempo	Borg Scale
Starting HR			_____
WARM UP			
(0:00 - 0:50), 50s	**V-sits**	**70**	2
(0:50 - 1:00), 10s	Active rest - high knees or seated twist	**70**	2
(1:00 - 1:50), 50s	**Back extension**	**82**	3
(1:50 - 2:00), 10s	Active rest	**82**	3
(2:00 - 2:50), 50s	**Bicep curls**	**94**	4
2:50 - 3:00), 10s	Active rest	**94**	4
(3:00 - 3:50), 50s	**Diamond push-ups**	**106**	5
3:50 - 4:00), 10s	Active rest	**106**	5
(4:00 - 4:50), 50s	**Squats**	**118**	6
4:50 - 5:00), 10s	Active rest	**118**	6
PHRASE WORK			
(5:00 - 15:00), 10 min.	Phrase #1	**118, 130, 142, 154, 166, 178**	7-10
Middle HR			#_____
(15:00 - 25:00), 10 min.	Phrase #2	**118 (130, 142, 154, 166, 178)**	7-10
COOL DOWN			
(25:00 - 25:50), 50s	**Squats**	**106**	5
(25:50 - 26:00), 10s	Active rest	**106**	5
(26:00 - 26:30), 30s	**Diamond push-ups**	**106**	5
(26:30 - 26:50), 20s	**Diamond push-ups**	**90**	3
(26:50 - 27:00), 10s	Active rest	**90**	3
(27:00 - 27:50), 50s	**Biceps**	**90**	3
(27:50 - 28:00), 10s	Active rest	**90**	3
(28:00 - 28:50), 50s	**Back extension**	**74**	1
(28:50 - 29:00), 10s	Active rest	**74**	1
(29:00 - 29:50), 50s	**V-sit**	**74**	1
(29:50 - 30:00), 10s	Active rest	**74**	1
Ending HR			_____

APPENDIX J: Visual Modified Borg Scale